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Relation of Internal Secretion of the Thyroids to Thyroid Hyperplosis (Goitre)*

By DR. C. C. PALMER, University of Minnesota, Physiologist, Experiment Station

GOITRE in our domestic animals is not an uncommon condition. However, very little is to be found in veterinary literature concerning the occurrence etiology, pathology, symptoms, and treatment of these disturbances. In the city goitre is seen quite commonly in dogs; especially is this true in the region of the Great Lakes. And less frequently is the condition noted occurring in horses. In the country goitre is occasionally seen in horses and dogs and a number of outbreaks have been reported occurring in new born lambs and calves; also in calves several months old, the mortality in these latter cases being quite high.

While goitre is a disease of the thyroid gland, there is more or less closely associated with it several small bodies—the parathyroid glands. Older textbooks confuse these two glands as well as the symptoms following extirpation. Present investigators now agree that the two glands are different with regard to structure and function, but in order to avoid confusion and to make the subject clear, it will be necessary to discuss both of these glands.

*Read at meeting of the Minnesota Veterinary Medical Association, January, 1915.

The Anatomy of the Thyroids and Parathyroids

Embryologically they both come from the same place and anatomically are in most animals fused together. The thyroid glands consist of two oval bodies lying on either side of the trachea just below the larynx and connected by an isthmus in most animals and surrounded by a capsule of connective tissue. It is made up of an aggregation of vesicles varying in size. These vesicles are lined by a single layer of cuboidal epithelial cells and are filled with a translucent material known as colloid of the cells. Some present granules and resemble the cells of a secreting glands, while others contain masses of colloid, or have undergone colloidal degeneration. In development the thyroid is formed by an outgrowth from the fore-gut, but the connection with the gut disappears long before the end of fetal life. (In rare cases part of the duct may persist and becoming gradually filled with fluid, give rise to a thyroid cyst[1]). The thyroids are richly supplied with blood. There are usually two thyroid arteries which arise from the carotid and enter each extremity of the gland. The nerves are derived from the sympathetic system.[2]

The parathyroids are small bodies varying in number, situated on the border of the thyroid gland or actually embedded in its substance. In histological appearance they differ widely from the thyroid, and consist of solid masses or columns of epithelial cells surrounded with connective tissue, and richly supplied with blood vessels. Nerves of the parathyroids have never been demonstrated. The number and situation of the parathyroids are not constant. As a rule there are four in mammals, two on each side, but this number is subject to variations in different individuals of the same species. The variability in their anatomical relations to the thyroid is of greater significance, for much of the uncertainty in which the whole question of the symptoms following extirpation of the thyroids was until lately involved arose from ignorance or insufficient recognition of this variability. In most animals the infero-anterior or external pair of parathyroids is more or less distinctly separated from the thyroid. The separation is especially evident in the herbivora, and in the monkey and man, and this pair of parathyroids is much larger than the other. In carnivorous animals, as the dog and cat, the anterior pair of parathyroids is closely adherent to the thyroid capsule. The supero-posterior or internal pair, both in herbivora and carnivora, is always very closely associated with the capsule of the thyroid, and frequently embedded in the substance of the gland. The consequence of this arrangement is that in the older experiments the chief masses of parathyroid tissue were much more likely to escape removal with the thyroid in the case of herbivorous than in the case of carnivorous animals.

But in even one and the same species considerable variations may exist. It is easy to see, then, that in removing the thyroid, the parathyroids would sometimes be completely removed as well, while at other times all or some of the parathyroid tissue would be spared; add to this that sporadic masses of thyroid tissue (accessory thyroids) often existing as far down as the root of the aorta (especially in the dog) must necessarily be spared in the most complete thyroidectomy, and it will cease to excite surprise that the symptoms and pathological changes described after that operation should have been so various and so contradictory. We know now that the parathyroids are perfectly distinct organs from the thyroids in histological structure and function, and in the consequences of their removal. Nor do they show any compensatory hypertrophy when the thyroid alone is exised or any changes which would indicate a definite relation.

Chemistry of the Thyroids and Parathyroids

The question naturally arises: What is the chemical nature of the active principle of these glands?

1. *Thyroids.*—Under normal conditions the thyroids contain iodin held in organic combination, in the form of an iodin-globulin. Recent investigation has shown that when iodin cannot be found in any other parts of the body, it can be found in the thyroid. Most investigators believe this iodin compound is the internal secretion of the thyroid.

In 1895 Baumann[3] discovered the presence of iodin in the thyroid and prepared a substance from it, which is an organic compound of iodin. This substance has been put upon the market under the name "thyroidin." This preparation Baumann and Ross claimed was the active principle of the thyroid, and would supply the function of the gland after removal. This view was substantiated by Hidebrandt and others.

Oswald[4] in 1899 considered the iodin of the thyroid to be bound up in a globulin-like body and the compound was called by him "thyreoglobulin." This, he said, has all the physiological properties of "thyroidin." The thyreoglobulin forms along with a nucleo-protein, the colloid substance of the thyroid vesicles.

Within the last two years renewed at-

tention has been given to the methods of determination of iodin and its estimation in the thyroid. And the test used today is Baumann's method modified by Hunter, and more recently Woelfel. The basis of this method is the fact that the amount of iodin dissolved in chloroform can be determined by the depth of the pinkish tinge which it gives to the solution.

Marine and Lenhart[5] have investigated the relation of iodin to the structure of human thyroids. They concluded that iodin is necessary for normal thyroid activity and that the iodin content in goitrous glands varies inversely with the degree of hyperplasia.

Marine and Williams[6] conclude in a later work that: *First,* iodin is necessary for normal thyroid activity. *Secdon,* iodin is the main index to the physiological value of the thyroid secretion (thyreoglobulin) to the body. *Third,* the percentage of iodin which a thyroid may contain is variable but the minimum percentage necessary for the maintenance of normal gland structure is quite constant. *Fourth,* the ability of the thyroid glands to store iodin depends on the degree of glandular hyperplasia rather than on the form or mode of administration of the iodin.

If this "thyreoglobulin" which is believed to be the internal secretion, is contained in the colloid material, then the question naturally arises, how does it escape? Some say it breaks through the vesicles and is absorbed, but we have no proof of such a process taking place. Carlson doubts that the colloid material contains this active principle, but thinks it is made in the cells themselves and passes into the blood or lymph which bathes them.

2. *Parathyroids.*—No active principle has been isolated from these glands. Careful investigation of the parathyroids in animals which have received no iodine medication has failed to demonstrate the presence of any iodin.

Symptoms Following Parathyroidectomy

The symptoms here given are those seen in a dog, because it is in this animal that parathyroidectomy has been more extensively studied.

1. *Parathyroid tetany or acute-typical type.*—This is the common form seen in this animal. The day following the operation the dog appears normal. On the second or third day the animal appears depressed, but along with this he is noticed to be restless at times, that is, the animal will be lying it its cage when suddenly it will get up and walk around, then lie down again. At this time and even the day before, if the peripheral nerves are tested by galvanic stimuli, it will be noticed that there is increased nervous excitability. About this time the respirations begin to be accelerated, salivation commences and the animal drinks large amounts of water. Although the animal continues to walk about, the gait appears somewhat stiff, and one may notice that isolated groups of muscles contract. Sometimes this can be easily detected by laying the hand on the head or region of the shoulders and the quick contractions or twitchings of the muscles will be noticed. These muscular contractions continue to increase in intensity until after a few hours the entire musculature is involved. When this stage has been reached, the animal lies in its cage panting, salivation is present and the muscular contractions may become tetanic in nature. The temperature is elevated to 110°-112° F. The respirations take on the form of an expiratory grunt, and there are repeated attempts to vomit. The diaphragm is also in a state of contraction and there is danger of the animal dying from asphyxia. Animals rarely die during the first attack of tetany. The symptoms above described gradually become less severe and in the course of a few hours, the animal may appear quite normal.

In mild tetany there is practically no change in the digestive tract, but in the

later stages there is paralysis. Carlson[7] concluded: There are no spasms, contractions or other evidence of hyperexcitability or tetany of the neuro-muscular mechanisms of the digestive tract in parathyroid tetany in cats and dogs. Lack of appetite for food is due to the depression of gastric hunger contractions and the vomiting to the stimulation of the nerve endings in the mucosa which are in a state of increased irritability. The gastric juice is depressed, there is lower concentration of hydrochloric acid and pepsin.[8] There is impaired digestion and in severe tetany food may remain in the stomach as long as three days without being digested.[9] There is also a decrease in the amount of bile and pancreatic juice secreted.

2. *Cachexial or chronic type.*—This type is rarely seen in dogs. The animal shows loss of appetite, loses weight, may have mild tetany, usually has a stiff gait. Such an animal may live for months and the cause of death is usually some infection due to lowered resistance. When such an ainmal dies, autopsy usually reveils the presence of accessory thyroids and parathyroids lower down along the trachea.

3. *Sudden parathyroid tetany.*—This type is occasionally seen. The dog appears perfectly normal for several days and when taken out of the cage to have its wound dressed, will play and become excited. As a result of the excitement the severe symptoms of tetany come on very suddenly and if precautions are not taken the animal will die during the attack.

Therapy of Parathyroid Tetany

1. Transplantation of parathyroid tissue has yielded a moderate degree of success. The transplant is usually made into the rectus abdominis muscle or under the peritoneum. One case is on record where this was successfully accomplished in human medicine. The case was that of a woman in which, after removal of the thyroid glands, slight tetany resulted. A transplant was made and the symptoms of tetany disappeared.

2. Feeding of parathyroid tissue or preparations gave no results.

Cause of Parathyroid Tetany

There are three theories prevalent relating to the cause of parathyroid tetany.

First, detoxication theory. In the absence of parathyroid glands certain toxic substances are not destroyed and thus tetany poisons accumulate and give rise to the symptoms described.

Second, calcium diabetes theory. It was first claimed that an animal in parathyroid tetany excreted more calcium salts. If this is true an animal suffering from parathyroid tetany should, if given calcium, be relieved or improved.

The following takes place when intravenous injections of a five per cent solution of calcium lactate, 15 to 20 cc. are given to an average size dog suffering from parathyroid tetany; the symptoms are immediately relieved and the animal appears to be normal. However, this fact remains: Calcium is not a specific; magnesium salts will have the same effect.

Third, internal secretion theory. Following extirpation the body is unable to combine or retain certain salts, especially magnesium and calcium.[10] This leads to the theory that the parathyroids produce an internal secretion which regulates the salt metabolism.

Endemic Tetany

It is interesting in this connection to mention something concerning the disease called endemic tetany, which occurs in certain localities in Europe. It seems to be a disease of large cities, usually appearing in the spring; it has a tendency to assume epidemic proportions, and it is very local in its distributions.

In India there is an epidemic tetany in rural districts. McCarrison[11] has called attention to this affection. He states that sufferers from tetany appear to be able to rid themselves of it by going to a locality where it does not pre-

vail. In the same country it appears to be a disease of child-bearing women, and there is a marked family tendency to the disease.

The seasonal prevalence of tetany occurs more commonly during the spring months. Chill, fright, and mental distress often provide the stimulus which produces the spasms. McCarrison further finds thymol a useful therapeutic agent and this rather points to the view that tetany is due to the action of toxic substances absorbed from the alimentary canal.

Tetany is a common disease in certain parts of Europe among shoemakers and on post-mortem hemorrhages of the parathyroids are found. Attention has also been called to the fact that parathyroid tetany resembles eclampsia and epilepsy.

Conclusions

Much, however, remains to be learned concerning the function of the parathyroid glands.

Diseases of the Thyroid

Before studying the effects of thyroidectomy it might be well to briefly review the disease of the thyroids.

Myxedema.—When thyroid insufficiency occurs in adults it leads to certain body changes and the condition is known as myxedema. It usually shows itself in a gradual swelling of the skin. This may be accompanied by nervous disorders, neuralgia, mental disturbances and skin disease. The swelling of the skin is at first noticeable on the face. The chin, eyelids, nose, lips, and cheeks swell. The skin may become yellowish and shows in fully developed cases what is called solid edema. The swelling resembles edema or fat, but on palpation feels softer and more elastic than fat, and unlike ordinary edema, it does not pit on pressure, nor does any fluid exude if the skin is pricked. The skin is wrinkled in some regions, pendulus in others. The swelling is fairly uniform over the trunk and limbs, but is most noticeable in the hands and feet. The skin becomes rough and cold. The hair becomes thin and scanty. In some cases the head is completely bald and the skin of the scalp becomes dry, brown, and scaly.

The mucous membranes may be swollen, and there is dryness of the mouth and nose.

The temperature is almost continually one, two, or three degrees below normal. Mental dullness, drowsiness, and slowness of reaction are characteristic of most marked cases. The operation of removing a part of the thyroid gland is sometimes followed by symptoms similar to those of myxedema. The condition is called "cachexia strumipriva" or "operative myxedema." [12]

Cretinism.— When thyroid insufficiency occurs in the young it leads to changes which are known as cretinism and the animal is known as a cretin.

Vincent[13] thinks that defective thyroid function in the mother is the essential factor in the production of cretinism. Vincent also states that cretinism is congenital, but it may remain latent pending its manifestation through the impulse of some accidental circumstance. A typical cretin usually shows symptoms similar to myxedema, combined with nervous symptoms, a peculiar condition of idiocy. A cretin infant will grow but its growth is usually greatly retarded. Besides showing some of the symptoms of myxedema, cretins are helpless, and usually deaf and dumb. There is a "knock-kneed" spasticity of the lower limbs, increased knee-jerk, and there may be marked flexion of the toes on the sole. The upper limbs assume a position of right-angled flexion; the thumb may be drawn into the palm of the hand and fingers closed over it, while the wrist is flexed. Cretins are usually "pot bellied." This is due to the degeneration of the abdominal muscles. The genital organs are not developed; and all the organs and tissues in fact show extensive changes. Cretins are very susceptible to other diseases and usually die young.

Enlargement of the thyroid glands may or may not accompany cretinism and myxedema.

Enzootic cretinism in animals.—Hutyra and Marek[14] state that where endemic cretinism occurs in man (especially in the enclosed valleys of the Alps, Pyrenees, in Francaria, and in the Palatinate) frequent cases of cretinism were also observed in dogs, and that the disease may possibly occur in the other domestic animals also. The cause of cretinism is found in a congenital complete failure of the function of the thyroids in consequence of disturbances in development or disease of the thyroid gland under the influence of unknown local injurious factors. Disturbances of metabolism thus caused result on the one hand in anomalies in the growth of the bony system and the soft parts, and on the other hand in disturbances of the development of the brain, and pyschotic symptoms due to them.

The symptoms consist in a moderate enlargement of the thyroid glands, a short compact spinal column, with a large short skull; the extremities are short and clumsy and the neck is short and thick. Such animals frequently suffer from digestive troubles. The voice is strangely weak, and its whole demeanor stupid, sleepy, and lazy. By treatment with thyroid gland, these symptoms can as a rule be made to disappear completely or in a great measure.

Exophthalmic goitre, Grave's disease, or Basedow's disease.—The cardinal symptoms of this disease are palpitation, exophthalmos and increase in size of the thyroid gland. A typical case showing all the symptoms includes bulging of the eyes, loss of weight, emaciation, nervousness, rapid pulse, gastro-intestinal disturbances and may show some symptoms of myxedema.

Exophthalmic goitre is more common in women than in men and seen during the time of puberty. It is more common in certain regions than in others.

With regard to the pathology of the disease, it has been discussed whether the primary lesion is in the nervous system or in the thyroid gland. There are certainly changes in the thyroid; and it has been shown by Halsted and Edmunds[15] that if a portion of the thyroid be removed from an animal, the remainder shows certain peculiar changes, described as compensatory hypertrophy. According to Marine[16] an enormous proportion of stray dogs in Cleveland are thus affected, though they do not show the symptoms of exophthalmic goitre. Dr. Marine has, however, observed that if these dogs be treated with iodides the alveoli or vesicles again become rounded and filled with colloid, and the gland returns to its normal histological structure. Oswald[17] has made similar observations and believes that we have in exophthalmic goitre a condition of thyroid insufficiency, since the gland is often empty of colloid and contains relatively little iodine holding secretion. Text books, on the other hand, state that exophthalmic goitre is caused by overproduction of internal secretion of the gland.

The most generally accepted theory as to the pathology of exophthalmic goitre is that the disease is due to over-activity on the part of the thyroid, that an excess of thyroid secretion is poured into the circulation. The strongest arguments for this theory are the good results in some cases of operative interference, removing part of the gland, destruction by the injection of irritants or causing atrophy by ligation of the blood vessels. However, operative procedure has not yielded as good results as one would imagine were this theory correct; and quite a number of our surgeons have abandoned these operations.

If this theory of hypersecretion is correct, feeding of thyroid extract should cause the symptoms of exophthalmic goitre. But the feeding of thyroid extract to animals which are susceptible to goitre has failed to produce the symptoms. Some investigators have found improvement in exophthalmic goitre following the feeding of thyroid extract.

The Cause of Thyroid Disturbances

1. *The infectious theory.*—Thyroid disturbances are common in certain districts and thus a great deal of speculation as to its etiology has arisen. It is more common to inland regions and rare near the seas. McCarrison[18] of India claims he can produce goitre by mixing the feces of persons suffering from goitre and adding it to the drinking water. When the water was boiled goitre was not produced. In these experiments he found the incubation period to be from ten to fifteen days. McCarrison knew regions free of goitre but when goitre families moved into such areas, other people living there developed goitre. However, individual resistance plays an important part, and this is why some members of a family show goitre symptoms and others do not.

Bircher[19] finds that filtering does not destroy the contagion but boiling does. Some have claimed to have isolated a specific organism but this has not been confirmed.

2. *Hereditary theory.*—It was suggested that the goitre seen in pups might be hereditary. Carlson[20] has studied congenital goitre in dogs. He states it is well known that goitre in dogs may be considered endemic in Chicago and the Great Lakes region. It seemed to him that some questions important in thyroid physiology and pathology might be brought a step nearer solution if it could be shown that in this region of endemic goitre, the young are born with normal thyroids, unless the mother has thyroid hyperplasia during gestation and that in the latter case the off-spring always shows thyroid hyperplasia. Accordingly the gathering of material on these points began in the spring of 1912 and up to date (January 1, 1914) data has been secured on 45 mothers and 250 pups. Material was also gathered in cats, especially in view of the fact that cats are much less subject to pathological changes of the thyroids than dogs.

The cat material comprises 26 mothers and 112 kittens. Since all the results are consistent, it seems that the material at hand is sufficient for presentation. Carlson distinguishes from a pathological standpoint three classes of glands. *First,* normal; *second,* hyperplastic; *third,* colloid. His conclusions are as follows:

First, the weight and histological character of the thyroids of newly born pups of mothers with colloid goitre are practically identical with those of pups from mothers with normal thyroid.

Second, pups from mothers with active thyroid hyperplasia have thyroids larger than normal in direct proportion to the degree of hyperplasia in the mother.

Third, kittens from mothers that have thyroid hyperplasia show thyroid enlargement and retarded formation of acini and colloid similar to that in the goitre pups.

Fourth, congenital goitre is not due to heredity but is obviously due to environment and the only environment that can act on the mammalian fetus is the maternal blood. Thus goitre in the new born is due to some pathological condition of the maternal blood. The suggestion is obvious that this pathological condition of the maternal blood is also responsible for the parathyroid hyperplasia in the mother.

(3) *Marines hyperplasia theory.*—Marine takes a different view. He states that the hypertrophy of the gland is due to an increased response to the needs of the organism. This is compensatory hyperplasia. The histological structure of the organ undergoing hypertrophy can not be differentiated from hyperplastic goitre. The vesicles and colloids disappear. The cells enlarge and the size of the gland increases until it meets the need. Then it re-organizes into normal thyroid tissue forming vesicles and colloid. Marine's theory then is this. There is response of thyroid on account of increased needs of internal secretion due to a derangement or disturbance in metabolism and although the gland increases in size it may or may not furnish

enough secretion to meet the demands of the body. If it does meet the demands there is simply the symptom of enlarged thyroid gland (exophthalmic goitre). If it does not meet the demand, there occurs along with the enlarged gland such symptoms as myxedema and cretinism.

At the present time Marine does not have many followers. However, Marine's theory seems to hold good in a great many cases. Large thyroid glands are commonly observed in young women about the time of puberty. If such glands are allowed to go untreated, in a large percentage of the cases the hyperplasia disappears in the course of time. According to Marine's theory, treatment with thyroid extract should give good results and it does. The writer recently experimented on a litter of four pups, all of which showed enlarged thyroid glands, which developed at the age of about one week. Two of the dogs received thyroid extract, the other two were used as checks. The dogs which received treatment showed improvement on the second day; the glands became soft and showed a marked decrease in size and after a few days the glands were reduced to their normal size. However, the checks which received no thyroid showed a gradual improvement and at the end of eight weeks their glands were of normal size also.

(4) *Common text book theory.—First*: Myxedema and cretinism are due to an insufficient or hyposecretion. *Second:* Exopthalmic goitre or Grave's disease is the result of an excessive secretion. This is a theory that is generally accepted by clinical men. The strongest arguments for this theory are the good results in some cases of operative interferences, by removing parts of glands, destruction by the injection of irritants or causing atrophy by ligation of the blood vessels.

Thyroidectomy

Until the anatomy of the parathyroids was understood, the symptoms that follow removal were very conflicting. Recent investigators have been able to remove the thyroids in some animals without injuring the parathyroids and very satisfactory results have been obtained. In man, before the consequences of thyroidectomy were known, the whole gland was not infrequently excised for goitre. If the parathyroids happened also to be completely involved in the operation, death quickly followed. But where only the thyroid itself, or the thyroid plus the small internal pair of parathyroids was extirpated, the condition called "cachexia strumipriva" was observed to supervene. Similar results have followed the extirpation of the thyroids in adult animals; *i. e.,* the development of symptoms of myxedema.

Thyroidectomy is followed in young animals by cretinism and excellent results have been obtained in this laboratory in producing cretinism in rabbits. In these animals the parathyroids are somewhat removed from the thyroids and extirpation of the thyroids in young rabbits, one week old, produces beautiful cases of cretinism. Other rabbits of the same litter are used as checks. It has been found in animals that complete removal of the thyroids is in general more serious in carnivora than in the herbivora.

Therapeutics of Thyroid Disturbances

Feeding of thyroid extract.—This has yielded good results in the cases of myxedema, cretinism and exopthalmic goitre *i. e.,* it has yielded as good results as could be expected. In the case of cretinism, *e. g.,* the cretin following the administration of thyroid extract shows some improvement, but due to the extensive changes which have taken place in the different organs and tissues it is to be expected that they could never be returned to normal. The same holds true in myxedema, but in this condition we find improvement to a greater degree than in the case of the cretin (the tissue changes are not as extensive). It

(Continued on page 283)

Methods of Immunization

By PROF. JAMES LAW, ITHACA, NEW YORK

(Continued from March issue)

SPECIAL METHODS OF IMMUNIZATION

In turning to special methods of immunization we must keep in mind the fundamental fact that a natural (racial) immunity depends on insusceptibility to the invading germ and its toxins. This is a hereditary, life-long quality, bound up in the constitution of the individual, and not likely to be cut short by any normal change of circumstances. This is our ideal example of effective resistance to a disease, and we would naturally seek it along similar natural lines. A transient, even if effective, resistance, through a change of chemical reaction, does not meet the case, since if we add the chemical antidote the coveted resistance is lost at once, and our subject is in the deadly grasp of the infection. Our source of defence must be resident in the individual or racial peculiarity of the subject, before we can trust it under all conditions. The *immunity* may be immediately due to one or several modes of resistance, it may depend on *antitoxins, deadly to the invading germ,* it may be due to such as act as *chemical antidotes* to the toxins set free by the germ, it may depend on *opsonins* attacking the bacterial germ and laying it open to speedy cytolysis, to agglutinins precipitives or one of the other defensive products. All of these agree in this that they are each the product of the defensive body-cells that have been acted on by the bacterial toxins. From the persistence of the defensive action started in this way the deduction is inevitable that in the *self-immunizing diseases* the attacked body cells, when once started on the production of defensive materials, continue for an indefinite time in this protective work and thus the system is fortified against the disease in question. In any disease in which the invaded body-cells have (acquired the power) of forming defensive products, *immunization* against that disease may continue indefinitely. The stimulus may remain in force indefinitely, but, as in some diseases, this force tends to wane in course of time, and ultimately to wear itself out, a renewal of the stimulus ofter becomes necessary. The duration of the defensive stimulus and output varies with different microbes and in different hosts of these microbes. With some the time is very short, while with others it lasts for the lifetime. Observation and experience must teach us to estimate the probable duration of *acquired immunity* for each separate disease and subject.

1.—Immunization by Toxins

Nature gives an obvious leading in this direction and was early followed in a search for *immunity* and *individual protection.* Science had not yet established a clear distinction between the *disease-germ* (infection), and its chemical toxic product when China and Persia awoke to the importance of inoculating on healthy persons, the virus of smallpox drawn from mild cases of the malady. (See July No., 1914.) This they continued with signal success. This practice spread into Europe, Asia and Africa and was naturally followed by the adoption of the same principle in other infectious disorders. Thus *sheep-pox, bovine lung plague,* and *blackleg* came to be controlled to a large extent. Begotten in a period of scientific darkness when there was as yet no suspicion of microbes, toxins, or defensive products, nothing further was to be expected in that age, and yet in this earliest departure in sanitary prophylaxis we can now trace clearly the utilization of the whole chain of defensive materials which from the creation had been liberally produced and which has only now been revealed through the

investigation and ingenuity of man.

In the prolific 19th century new and greater strides were made towards the use of toxins alone in drawing out nature's defenses against spoliation by infections. For a time, however, the aim was to follow the Oriental lead in using the malady itself as a protector and the attempts were, in the main, to reduce the violence of the dreaded disease to a grade that would be nonlethal.

Toussaint (veterinary professor at Toulouse) sought to mitigate the violence of *Anthrax* by defibrinating the blood drawn from the anthrax body, heating the serum for ten minutes to 131° F., and injecting it in the animals to be protected. He had at first a striking success with sheep, but later in a test at Alfort he met his Waterloo in a most discouraging record of deaths. He had failed to take into account the dangers of *weakened,* but not yet devitalized virus. He had hoped to devitalize the germ sufficiently to make its use free from risk.

Pasteur and Roux made artificial cultures of the anthrax germ at 107.6° F., exposed to air, but the results proved too uncertain; very suspectible subjects still suffered and died.

Chauveau subjected a virulent anthrax germ to culture for eight days, under a pressure of eight atmospheres, and at a temperature of 100.4° F., but even this failed to secure to the subjected animals at once safety and immunity.

2.—Toxins Sterilized by Heat

To test the protective action of *microbian toxins* and *defensive products of the invaded body-cells,* in the *complete absence of living microbes,* in 1880, I subjected the virulent products of hog cholera (blood serum, intestinal mucus) to three successive exposures to heat (131° F., 150° F., and 200° F.) and injected one drachm of the product, subcutem, into each of two healthy pigs. Later exposure of each of these subjects in the same pen with hog-cholera pigs, and again injection with fresh active virus of the diseased pigs, had no effect in producing dangerous illness. (U. S. Dept. of Agric. Report for 1880, pp. 515-519.)

In 1881 I had a similar success by injecting young healthy cattle with the *heat-sterilized exudates of lung plague of cattle.*

Again in 1884 by injecting *heat-sterilized blood serum of anthrax cattle* I obtained an effective immunization in the animals treated. This I later repeated a number of times as opportunity served.

Here we had a clear demonstration of the prophylactic and immunizing value, not, it must be confessed, of the isolated antitoxins alone, but of the antitoxins combined with the defensive products of the body cells. But the defensive products are all specific to the disease in hand, and that the comingling of many germs from different sources, of their toxins, and of the antibodies produced by the body cells contending with them, this is often a direct invitation to uncertainty or even to an aggravation of the result. Such an indefinite combination opens the door *first* to *doubt* as the particular germ, that we desire to take due precaution against, may be left out entierly when the too heterogeneous combination is brought together; *second,* there is danger of lessening the potency when the attempt is made to cultivate in one receptacle such different microbes and to bring together such a variety of material products; *third,* there is risk of a lessened efficiency as the growth in one receptacle of two incompatible germs, together with their chemical products having opposing chemical reactions may at once check the vital growths and the fermentations upon which the expected success of our venture depends; *fourth,* with a heterogeneous combination of different microbes and cells and their chemical products there is danger of mutual interaction and decomposition, and of the consequent elimination of those ingredients that are really essential; *fifth,* other sources of failure, under the commercialized system, is the liability to mistake in making a diagnosis in which case, of course, the stock remedy must be all at sea; also the altera-

tion of the remedy by overkeeping, overheating, exposure to light; again the animal may have become unfitted by inattention to suitable feeding, watering, ventilation, rest, etc. With proper care to avoid such drawbacks, a fair measure of success may usually be secured.

3.—Injection Subcutem of Filtered Virus

This was conceived and attempted by Toussaint but the unreliability of the early filters, and the discovery later of ultramicroscopic and unfiltrable germs seriously limited the applicability of the method. With the later introduction of the Berkefeld and Pasteur filters the adaptability was extended over the plagues with larger germs (micrococci, staphylococci, streptococci, bacilli, spirilli or spirochœte), but still leaving a considerable list to which the method is poorly or not at all adapted. Leaving these latter out of account there remain a considerable class to which the filtered virus treatment is not ill adapted. To apply it to plagues having invisible microbes at any stage of their life, to those forming spores, or to a large class of the protozoa is but to invite discomfiture.

Autoimmunization and Autotherapy by Filtered Virus

Antoinoculation removes many objections to the use of simple filtered virus. The main advantage lies in the fact that the prophylactic, therapeutic or immunizing material is derived from the infected animal that is to be treated by it, and that the latter is already largely insusceptible to the germ. If an infection, dangerous or lethal to animals of this genus, is in the system furnishing the protective agent, this infection cannot seriously harm this particular individual of the genus, for its system is already charged with the microbe and has shown itself capable of survival. The body furnishing the protective or defensive agents may indeed carry some other microbe, highly injurious to the great mass of animals of this genus, but to which also this particular animal has become immune. It is therefore easy to see how this second germ, harbored by this immune animal, may, under careless manipulation, ecsape to infect all the susceptible individuals within reach, and thus start a widespread and destructive epizoötic. Animals that have been steadily in contact with that one which furnishes the immunizing materials can also be held to be immune, as they have been exposed and have not suffered, but this is no ground for assuming that others of the genus, but not exposed hitherto, will also prove immune. The animals that have been exposed will presumably escape; those that have not been so exposed will not necessarily escape.

The next count in favor of this method is, that the protective agents cannot fail to carry the exact and appropriate antagonists of the disease that is to be met. They have been drawn from an animal suffering from that malady and in active development of its proper antidotes. These defensive agents have thus been produced as it were, automatically and infallibly. The defensive blood products are those of the victim of the malady to be opposed, and contain all the elements engaged in such opposition. In them are found the chemical opponents of the microbes as formed in the cells of the blood, lymph and body; the antitoxins and other antibodies which are poisonous to the microbes or antidotal to them; the ferments and cytolytic products which are elaborated by the white cells and phagocytes; the opsonins which weaken the microbes and render them increasingly vulnerable by the phagocytes; the alexins, sosins and other opponents of microbes. Finally they contain the microbian toxins which although primarily poisons have their redeeming virtue that they rouse into special and vigorous activity, the various body-elements that produce the defensive products. These toxins are thus the stimulants to the general labor of defense, and not only so, they automatically select the defenders and the fields in which they shall be especially active in stemming the tide of danger. This method at once

does away with the worst effects of blunders in diagnosis. The careful operator should under the circumstances be enabled to exclude, from the body of the animal treated, any and all bacteriological material that was not present in the same body before treatment. If an infection, dangerous or lethal, under ordinary circumstances, to an animal of the same genus, has already for a length of time had a home in the system of this particular individual, there is a strong presumption that it is not lethal to this animal. It may not always be safe to handle freely in the midst of susceptible animals of the same genus, as the germ, though harmless to this animal, may escape and be transferred to a highly susceptible one of this genus, and thereby start a deadly epizoötic in a susceptible herd. The germ may even possibly become deadly to the animal that furnished the immunizing material. A century ago it was known that blackleg might be with comparative safety inoculated on the extreme, dried up tip of the calf's tail, but, as in the case of lung plague, it could only be inoculated on the loose connective tissues under the skin of the trunk *on pain of death*. So with other inimical conditions. A slightly immune animal that would survive a moderate dose of anthrax, would die, infallibly, if it took also a fair dose of lactic acid. Another condition might easily ensure death. If the treated animal has lockjaw, or has been overdriven, his lactic acid, coming from excessive muscular work, together with the fatigue poison would seal its fate. It does not follow that because the germ has been harbored in the system for a length of time, that it must be entirely ineffective. Such an objector must have studied the modern field of hormones and proteids to little purpose. Even the bland and nutritious peptones, the foundation of animal tissue-nutrition, is a deadly poison when injected directly into the circulating blood. It requires the action of the living tissues met during absorption to change the deadly toxic peptone into the vitalizing and nutritious proteid of the vital fluid.

Autotherapy has now been used for a number of years by veterinarians in the therapy of infective wounds and injuries (fistula, quittor, abscess, serous abscess, and other traumas), and with remarkable success. In such cases a simple formula (such as the following has been largerly resorted to: Draw from the phlegmon, through a small nozzle or trochar, 1 dr. of exudate into a sterile bottle; add 1 fluid oz. distilled or boiled (sterile) water; shake vigorously so as to dissolve and dilute the albuminous liquid; set aside for 12 or 24 hours; pass through a Pasteur filter and use the clear filtrate for injection, subcutem, where the connective tissue is loose and abundant. The dose will vary with the size (horse ½ oz., dog 1 dr.). Local swelling with congestion and slight hyperthermia sets in for 24 hours or over. When the local and general disorder has subsided, and in case of an open wound, if that has taken on a more healthy appearance, a second injection may follow in a slightly different part. Two or three injections may suffice for an acute disease. In chronic cases it may have to be kept up for weeks or even months, the condition of the parts being taken as a guide for repetition. In immunizing animals against shipping fevers (strangles, influenza, contagious pneumonia, etc.), the expectoration is used in the same way, and the same with other infectious diseases. In immunizing animals for shipment, however, the expectoration must be secured from the prevailing infection at the point of shipment, along the route or at the destination to insure identity. Actual autotherapy is precluded, as then the animal to be shipped must first qualify by itself contracting the disease.

Another limitation to this method arises in the case of any disease that is habitually fatal, and when the deadly virus in the disease in question is concentrated in the mouth, pharynx, and nose. This excludes such diseases as rabies, rinderpest,

glanders, gloss anthrax, diphtheria, roup, necrotic bacillosis, etc.

4—Injection of Dilute Virus Into the Veins.

This is only available where the germs are *microcidic* or, when the oxygen in the circulating blood is too abundant to allow the survival of the germ even in the veins. (Tetanus, blackleg.) In addition to this, exhaustive precautions are required to ensure that no germ shall be lodged on or in a tissue, *but only in the circulating blood.* Similar precautions are imperative to exclude any chance contact with other deadly pathogenic germs. For different diseases the dose may vary from one microbe upward. For this method the most deadly germs are of course inadmissible.

5.—Injection, Subcutem of Highly Immunized Blood or Blood-Serum.

In this an animal is treated with, first, a small, nonlethal dose of the virus, to be followed by increasingly larger doses, but keeping carefully within the non-fatal amount, until the subject has been charged as heavily with germs, toxins, antitoxins and other defensive bodies as it will bear. Then the subject is killed, its blood received into sterilized vessels, with the greatest precautions against outside contamination, and the blood serum exuding from this is injected into the veins or tissues of the animals to be protected, so that they are charged with the defensive materials to an extent that will make them immune from the effects of any dose of infecting material that they would be at all likely to be subjected to. This confers a working immunity on the latter. It does not, however, guarantee, against infection of other, and nonimmunized animals by transference of the virulent germ from either donor or recipient. In charging the animal used to raise the protective materials, it is naturally first primed with the germ of the infection. We make it first and foremost, a culture flask for the limitless multiplication of the dreaded microbe. Thanks to the native resistance of the animal system, and its inherent power of self defense, the increase of the deadly or health-destructive germ becomes an instrument of beneficence, the messenger of pain a veritable agent of health and well being. But one should not for a moment forget the bridge by which we escaped. It is our blessed privilege to hitch up our deadliest enemy to render us the greatest service. But in all intelligent use of this servant we must never forget that this present servant began as a foe and that at bottom he is still a foe and a deadly one, that we can only control for good by the exercise of our best knowledge and our soundest judgment. The evil root has not been killed, it has merely been harnessed for our benefit, and it is only by a persistent intelligent control and direction that we can hope to retain the grudging service now rendered. Our unwilling slave is with us it is true, but for so long only as we keep him shackled and confined, and guard against his disposition to do us wrong. The malignant germ is still with us, and though we have stolen a march on him it would be unworthy of our temporary triumph to ignore his inherent malice and allow him to let it loose upon us once more. It has been too simply assumed that, in all such cases, the living germ speedily perishes, but no proof of this has been shown. We do not really know how many, nor how habitually these germs survive in the system. It has long been known that after a non-fatal attack of hog cholera, for example, a number of the survivors continue to carry about and distribute the infecting germ to animals that remain vulnerable to the disease, just as we habitually meet persons who are notorious carriers of typhoid fever. The same is true of the carriers of influenza (horse), diphtheria, contagious pneumonia, strangles, etc., so that the burden of proof must always rest on him who denies the possibility of this in any particular case. The individual animal that has been carefully dosed with the highly immunized blood serum is safe, but the next animal, having escaped immunization, and remained susceptible,

cannot be guaranteed as safe if brought in contact with one of these carriers or even with the animal or its products that have been treated with the blood in which the protective material has been raised. The animal treated in this way is strongly (almost infallibly) protected, but the disease germ incidentally planted in his system, may or may not have perished—in a number of cases it certainly has not.

6.—Injection Subcutem of Highly Immunized Blood Serum.

To secure the immune serum an animal is treated with nonlethal injections of the virus in increasing doses, until he has been strongly charged with germs, toxins, and other defensives as fully as he can bear. Then he is killed and his blood received in sterilized vessels and set aside, covered, until the serum has separated. This immunized serum is injected into the blood or tissues of the animals that are to be protected, careful antiseptic precautions having been taken. After this in most cases they prove immune, whether tested by exposure to the infected, or themselves injected, subcutem, with undiluted virus. Both giver and receiver are fortified against the virus, because both have entertained the obnoxious microbe and have stimulated the body cells to the more active production of antagonistic compounds. Each can now be exposed to the infection or even inoculated with the undiluted virus. For both it may well be said that in their powers of defense against the microbe there is little more to be desired. Can we say as much as to the absence of risk of conveying the disease to susceptible (non-immunized) animals?

We began with the charging of our serum-yielding animal with the microbe of the infectious disease we are fighting. We go on loading the subject with this, as long as we think he can stand it, or as we think we can thereby increase the amount of the defensive materials in his system. When ready to take from him the first yield of immunizing blood, it is certain that this blood contains the living, virulent microbe, and this we inject into the blood and tissues of the animal we wish to protect. We have now seeded new fields with the dangerous living germ. The animal injected is exceedingly susceptible to this germ. This germ can escape through the healthy, living animal membrane, as it can enter through it. There is, it must be admitted, a most valuable safeguard in the cases of animals injected prophylactically. In addition to the microbe such subjects receive a full measure of the prophylactic antibodies which guard this particular system against a successful microbian invasion by this germ. But what of the unimunized and unprotected subjects that usually freely approach the yielder of blood serum, and what of the susceptible animals that pick up the germs scattered accidentally by the bearers? These receive the bane without the antidote. Can we wonder at the constantly recurring fresh outbreaks that keep the epizoötic constantly in existence and constantly moving? As already stated, the presence of antibodies in the animal body gives no assurance that the living microbe in the body shall be promptly killed there. Once it has escaped from the living body with a more or less dense environment of highly susceptible subjects, and the myriad mediate channels open for its extension, and no logical mind can hope for a cessation of outbreaks and extensions.

By this method the greater number of new cases are warded off. But as sanitarians our duty is not alone to reduce the number of new infectious cases, but to leave no single remaining infectious case ready to propagate any more infection. Short of this we have come short of the real object of our work, and become contributory to the propagation of the infection, instead of agents for its extinction. In sanitary work against contagious diseases we must ever keep dominant the supreme need of extinction over simple restriction. Unless this thought be kept ever uppermost we may well expect to leave the plague in a condition of vitality

(Continued on page 270.)

The Veterinarian in Relation to the Public Health*

By G. H. CONN

FROM the beginning of time of which we have authentic history, there are records and accounts of men, who have had in mind the betterment of the conditions that tend to make living more enjoyable for their fellow men. These efforts have been along several lines, each of them being of more or less importance. Some have educated the people and trained them for an active life in some of the trades and professions; some have advocated and taught religion; others have taught the people the dangers of contagious and infectious diseases and how they might avoid them. From this desire upon the part of medical men to show the people how they might avoid some of these conditions, a great deal of investigation and research work has been carried on, and we are now able, by the use of the various products of serum therapy which has resulted from this work, to prevent many of the most highly and contagious and infectious diseases and have proved to the people the value of hygiene and sanitation to the public health. To us the most important have been those who have shown the people the dangers that may be encountered from the use of those food products that are derived from the domestic animals, and the necessity of keeping them in clean and sanitary surroundings. From early times there has been a few who have realized that where animals have been domesticated, that the laws of nature have been violated to such an extent that with the lack of sanitation and hygiene, that they will in this way contract diseases and decimate their numbers and in many instances transmit disease to members of the human family. More often, however, they produce a diseased condition in the person that uses some of the food products which they produce. Gradually with the increased knowledge of our bacteriologists and pathologists, the veterinarians have made and are now making rapid progress toward making the part of the people's food that is derived from the animal kingdom pure and wholesome.

Milk and meat as foods have received much more consideration at the hands of investigators, because they are used as food by so many people. They are used as foods by more people than any other foods, and milk in itself is primarily a food for the young. Cow's milk is much used in the large cities where there are a great many bottle fed babies. It seems to me that the procurement of a pure and wholesome food supply, and at the same time one that is cheap and nutritious, for the people of our country, is a work in which any one of us might well feel proud to be engaged, and I think you will agree with me in saying that it should receive much more consideration than it does at the present time. Too many veterinarians do not pay enough attention to matters of this kind, simply because their municipalities have not authorized inspection. Meat and milk are not detrimental solely through the disease they may carry to the human family, but they decompose very rapidly if they are not properly handled and then there are some unscrupulous dealers who adulterate them in various ways. By careful observation and tests, methods have been perfected by which these frauds may be detected. The federal meat inspection of the U. S. Department of Ag-

*Presented at meeting of the Northwestern Ohio Veterinary Medical Association.

riculture is fast becoming perfected and has been the means of keeping billions of pounds of diseased meats from being placed upon the market. About sixty per cent of the meat supply of the United States is under Federal inspection, but this is not enough—it should be 100 per cent. It would be wise to have municipal inspection, and in fact I for one think it is a duty that the people owe to themselves to demand that their supply of milk and of meats be as pure and wholesome as it is possible to obtain them. I think the time is not far distant when the people are going to demand this, and that will make necessary local inspection. This could be done very well by doing away with the small slaughter houses, and substituting municipal abattoirs to do the killing for these small butchers, having competent veterinary inspection at these plants. The majority of people do not begin to realize the protection to their health that the Federal meat inspection act has given them. The regulations are such that it gives the consumer every possible protection that is necessary to protect their health. It gives the consumer the benefit of the doubt. It was a tremendous task at first, as most of the large packing houses were insanitary, and it took time to convince the packer that it was profitable as well as necessary that the establishment must be sanitary and handle its products in the same way.

Until the last few years the majority of people were of the opinion that anything to be of any value regarding the public health must necessarily come from the practitioners of human medicine, but the recent advances and discoveries made in the study of comparative pathology and medicine have convinced the people that a qualified veterinarian should be the chief adviser on those products of the animal kingdom which are used for food. Some of the greatest and most important discoveries concerning the causes of some of the diseases affecting the human family have been made possible through the discoveries and theories of veterinarians.

There is one thing that I think has been neglected by the majority of veterinary colleges, to some extent at least, and that is the food products that are derived from the animal kingdom. I know that all colleges have instruction along the lines of milk and meat inspection, but they do not seem to have time enough to devote to the subject. I think the time is fast approaching when it will be necessary that the colleges give more complete instruction along these lines than they are now doing, as many of the larger towns have already secured veterinary inspection for these products and many more are going to fall in line in the next few years and this will call for a larger number of men that are qualified to do this kind of work. People are fast coming to realize the dangers to be encountered in the consumption of meat and milk that is not under competent inspection. Not all the dangers are from the food products consumed but some of the animal diseases are transmissable directly to human beings. Among these are glanders, tuberculosis, anthrax, foot and mouth disease, etc. Some of these are very fatal.

Veterinarians have not directed their efforts wholly to the disease that may be spread by animals or the conditions that may arise from the consumption of their food products, but a great deal of investigating has been done to prevent the wholesale and detrimental adulterations of other food products, especially where these have been placed upon the market in competition with and labelled as pure food products. The adulteration of summer drinks, teas, coffees and canned goods, have been the most widely practiced, because the demand is so great for

them that the adulteration of these products lessens the cost of production, the adulteration becomes very profitable financially, and besides it ofttimes enables the producer to use much inferior goods in their preparations, that no one save an expert could detect it. The products mentioned above are not derived from the animal kingdom, but are so intimately associated with them in the markets and are largely a part of the food consumed by the average individual, that it will not come amiss to mention some of the dangers that may result from their consumption as food products and some of the most common methods of adulterating them.

With the advent of summer there comes the iced drinks, and these are sold largely to children, and it is to these that they do the most harm. These are the pops, ciders and ales, and several others that have good sounding names, but do not contain the properties that their names would indicate. This class of drinks are a common source of gastro-intestinal troubles in children, but the reason that they have almost escaped notice as being the cause of these conditions is due to the fact that too many physicians have not made much of an effort to find out the cause of many of these conditions that affect the young. The most of these drinks are carbonated waters, and for this reason they have prohibited the use of lead stoppers for these bottles in the majority of places, because the carbon-dioxide gas with which these waters are charged acts upon the stoppers, and in this way some very poisonous lead oxides are found in the drinks, enough to cause mild lead poisoning if large quantities of the drink are taken. In the cities the bottling plants for these drinks are often of the most insanitary type, and it would be impossible to prepare a product here that would be fit for human consumption. The bottles should be thoroughly sterilized and the water that is used should be pure, care being taken that it does not carry any of the germs of typhoid, diphtheria, scarlet fever or any other contagious or infectious diseases. The pipes through which the water is drawn that is used in these drinks, should not be of lead for the reason mentioned above. One of the most common, also one of the most objectionable, adulterations of these drinks has been the use of saccharin to sweeten these drinks. Saccharin is a drug and one of the coal-tar derivatives. One pound of it will sweeten 400 to 500 times as much as one pound of sugar.

But the adulterations do not stop here. Many of the syrups used in the manufacture of these drinks are artificially preserved with sodium benzoate, salicylic acid, etc., and to produce the bright colors of many of these drinks, the coal tar derivatives are used. To produce some of the bubbling and frothing that is commonly seen in some of these drinks, saponin, a derivative of soap bark, is often used. This is not, however, a common practice. It might be well here to add that soap bark has been much used in the adulteration of baked goods and candies. A small quantity of capsicum is added to ginger ale by some manufacturers to take the place of the ginger —quite a reduction in the price of the cost of production. Many of these products are misbranded, that is, they do not always contain the ingredients signified by the name on the label.

The most harmful of all the adulterations of these products is the use of narcotic drugs. Caffeine is the least harmful of those used, but some have used coca-leaf extractive and still others have used cocaine, which is the most harmful of them all. The manufacturers in using these drugs have two objects in view—the forming of the habit for these drugs and the stimulating properties of the drugs.

Ice cream when prepared by careless manufacturers is often very dangerous, from the various bacteria that may

be contained in it. It is rendered more dangerous by those persons who have greater regard for the almighty dollar than they do for the health of those who may use their product, that they will use various artificial preservatives and other adulterants. Some of them think, so it seems at least, anything to reduce the cost of production and increase its keeping qualities and still resemble pure ice cream so nearly that it cannot be detected only by an expert, is good enough for them to market to the general public. It is surprising to know the bacterial count in ice creams carelessly prepared. Out of 263 samples collected in Washington, D. C., the bacterial count ranged from 250,000 to 50,000,000, and the majority of them being over 25,000,000 per cubic centimeter. In 38 of these virulent strains of streptococci was found.

When these products are not stored at low enough temperatures the bacteria in them may develop poisonous chemical products known as ptomains.

The most common adulterants used in the manufacture of ice cream are dextrin, starch and gelatin. This renders its keeping qualities far above what they otherwise would be and also lessens the cost of production.

The ice cream cone is ofttimes adulterated with the coal tar dyes or mineral colors and is then detrimental to health.

Ice cream and beverages are wholesome and are not to be condemned when they are clean, pure and unadulterated. However, they should not be used in excess. Ice cream made as it should be is very palatable and nutritious, but it should contain nothing but cream, sugar and flavoring and should be prepared in a sanitary manner.

Coffee is prepared from the Caffea arabica by roasting it at a temperature of 200 degrees Fahrenheit. A few years ago several manufacturers came to the conclusion that they could make an artificial coffee cheaper than the dealers could buy the pure coffee, and so many of them made an artificial coffee bean from wheat bran, wheat flour, lupine flour and other starch products. These were sold to the dealers to be mixed with their coffee and in this way added largely to the properties, but robbed the consumer. Another practice was the coloring of inferior coffee with chrome yellow, burnt umber and tumeric. Among a number of samples of ground coffees that have been analized the following substances have been found: Artificial coffee pellets, chicory, wheat bran, graham bread crumbs, ground corn and peas, buckwheat and barley.

None of the above adulterations, unless it be the coloring of the coffee, are dangerous to health, but their use should be discouraged as a fraudulent practice.

Tea, next to coffee, is our most important beverage, and China and Japan furnish about 90 per cent of all the tea in the world. The adulterations of tea cannot be said to be dangerous at all, but it enables them often to use an inferior tea that they otherwise would be unable to use. About the only way that tea is adulterated is by treating the leaves so that they have gloss and color. Prussian blue, indigo and tumeric are the agents used for this purpose, but the amount used is so small that it is doubtful if it would have any deleterious effect upon the individual using the tea.

Possibly no other branch of the food industry has undergone as much change and is as much in demand at the present time as the canned food. Nearly all the fruits and vegetables that are relished by the American people are now marketed in tins at a moderate price. The demand for this class of goods soon became so great that the canner that was inclined to be dishonest came to the conclusion that it

would be profitable to employ a good chemist, so that he might buy inferior fruits and vegetables and adulterate and preserve them in such a manner that they might be put upon the market as first class articles of food and escape the notice of any save an expert. There were many chemists who lent themselves to this work, and without a doubt it paid them very well. One of the worst faults with the canneries so far has been the insanitary condition of the plants, but since inspection for this class of products has been carried on a great deal of this has been remedied. One of the greatest dangers in canning vegetables has been the failure to render them sterile. When they are not cooked long enough to kill all the bacteria in them, these then develop those chemical products known as ptomains.

There is more green corn used for canning than any other fruit or vegetable. It formerly was very difficult to sterilize corn, but with modern machinery this has been rendered comparatively easy. This has lessened the cases of ptomain poisoning in those who relish this vegetable. One of the old adulterations of corn was the bleaching of it with the fumes of sulphur or treating it with the sulphite or bisulphite of sodium or potassium. This often resulted in deposits of sulphurous acid. Saccharin is also used to sweeten corn, and this should be condemned.

Peas soon lose their color after they are shelled, and some canners have used a solution of copper sulphate to give them a bright green color.

Peaches are not very often adulterated by the canner, but in a few instances canners have used chemical preservatives, but this has largely fell to the lot of the housewife who has used the so-called preserving powders (sodium salicylate) to do away with the major part of the cooking. These preserving powders are harmful.

By the use of coal tar dyes unripe tomatoes are often made to resemble ripe, high grade fruit. Saccharine is also used at times in the canning of tomatoes.

The pure food and drugs act has done away with the most of the wholesale adulteration of canned goods, but doubtless there is a great deal of it still practiced.

As milk is an animal product and a very important food, its inspection is more important to veterinarians than the foods and beverages already considered. In the production of milk for human consumption the very first act is a violation of nature's laws. Nature intended that the young animals nourished upon milk should draw it direct from the udder. Milk in being drawn by hand or by any artificial means is sure to undergo more or less contamination. The dirt and bacteria on the teats, the loose hairs on the body, the dandruff, and the particles of dust floating in the air from dusty hay and fodders are common sources of this contamination. The time elapsing between the time of drawing and using milk, and the rapidity with which bacteria grow in it, make it necessary to use the utmost precautions in handling it. When calves are fed with the milk drawn artificially, the contamination, decomposition and irritant properties which develop, ofttimes prove dangerous and many times fatal, because of the gastro-intestinal conditions which it produces.

Infants that are bottle fed, often suffer from the same condition, and in the cities where bottle babies are common, from ten to twenty per cent of the infant funerals can be safely attributed to gastro-intestinal ailments due to their food. In one of the large cities of this state where they have had competent inspection, during the first three years infant funerals were reduced 33 1-3 per cent—a record of which to be eminently proud.

The stalls where cows are kept should be cleaned some time before milking so that the cows may be well bedded down and the dust have time to settle, and the odors to vanish. The attendant who does the milking should not smell of the odors of other farm animals with which he may have been working, and should wear clean clothing and have clean hands. The cows should be cleaned and the udder wiped with a damp cloth. The top of the pail should be as small as is convenient to milk into. The pails and vessels in which milk is handled should be so constructed that the milk could not collect around seams and thus be a breeding place for the various kind of bacteria that are usually found associated with milk. All these precautions lessen the dangers of using milk as a food.

Cows that have diseased udders are sure to give off some of the infection in the milk when it is drawn. Also in other diseases where the other eliminating channels are not working properly, infection and other poisonous products are sometimes given off in the milk. If a separate vessel were used for the first milk, a great number of the bacteria would be kept from the milk drawn later.

The time elapsing between the drawing of the milk and its consumption, especially by those living in cities, is at best several hours, so it becomes necessary to use the utmost precaution in handling milk for this trade if the product is to be even fairly safe for human consumption.

Care should be taken that the attendants who do the milking are not infected with any contagious disease or are around any one with such a disease, as they are apt to contaminate the milk when handling it, and in this way be the means of causing the disease in those using the milk. Ofttimes the water used to wash the dairy utensils may be impure and contaminate them and through them the milk with the germs of some of the more common diseases, such as typhoid, diphtheria or scarlet fever.

Possibly the worst diseases that may be transmitted through the milk are tuberculosis and the streptococcus and staphylococcus infections that usually are found in the milk supply of those babies who develop that dreaded and often fatal summer complaint.

In preparing milk for those babies who must depend on cow's milk for their feed, and especially for those babies in cities a hundred miles or more from the cow that produces it, the utmost care and judgment must be exercised. The milk should be pasteurized but not sterilized, as bringing milk to the boiling point reduces its food value and renders it undesirable as a baby food. When milk is heated to the boiling point its natural ferments are destroyed, it loses in nutritive value and becomes prone to cause digestive disturbances. Milk should be raised to a temperature of 145 to 150 degrees F. and then allowed to remain as nearly as possible at this temperature for thirty minutes. It should then be promptly cooled and kept cool until it is used. Milk after it is pasteurized should not be allowed to set in the sunlight or in a warm room as there are always some bacteria which are not killed by the pasteurization and they will begin to develop when the temperature of the milk is raised.

Certain chemicals have been added to milk to preserve it and to kill the bacteria or at least to prevent its growth. Among these have been borax, boracic acid, salicylic acid and formalin. It may be safely said that none of these but are detrimental to health. These practices are now forbidden through the pure food and drugs act.

It might be well to mention here that 100,000 cases of typhoid fever occurring each year in the United States are attributed to milk borne infection.

We will now take up the most widely used food product derived from the animal kingdom that is under federal inspection, and we refer to meat and meat food products. It is a well known fact that the meat producing animals are often affected with diseases that make their meat unfit for food and also have diseases that may be transmitted to man. Some of these diseases are very contagious and highly fatal to human beings. It is a duty that every individual owes to his fellow man to do all in his power to make his life here as happy and as free from pain as possible.

It seems to me that the procurement of a pure and wholesome food supply for the people of one's country is a work of which any one should feel really proud, and in my estimation such a work should be considered worthy of any individual. People are fast beginning to realize the dangers that may ensue from the consumption of contaminated milk or meats and of milk or meat of diseased animals. The importance the meat inspection plays with the Department of Agriculture can be very readily understood when you take into consideration the gerat number of veterinarians that are employed for this purpose and the rigid regulations of the Bureau of Animal Industry. The department also keeps watch for any contagious or infectious disease that may break out in the domestic animals in the United States or its possessions that will be detrimental to the live stock industry or to the public health. All such outbreaks are placed under Federal quarantine. Several serious diseases of live stock have been eradicated in this way, and they are waging their efforts and using their influence in controlling some of the widespread diseases of live stock that are prevalent in the United States at the present time, the principal of these being hog cholera and tuberculosis. The qualifications that are demanded of the Bureau of Animal Industry employes is proper evidence of the importance of their work as the Department of Agriculture sees it. An individual must be a graduate of a veterinary college recognized by the United States Civil Service Commission and must then take a competitive examination, and is then appointed according to his rank in the examination, in case he passes the examination and they need him. They are appointed on six months' probation, and if their work proves satisfactory to the department they are made regular employes of the bureau.

A great many individuals have a mistaken idea about meat inspection. In establishments where the killing is rapid there are several inspectors, each having a particular part to inspect, and then there is the "final inspector" who devotes his time to making thorough inspection of those animals who have shown some lesions, so that proper disposition may be made of them.

The government also have antemortem inspectors at the various yards where cattle are sold and sent to be slaughtered and they are constantly on the lookout for any ainmal that is sick or is injured in any way, and when an animal is suspected of being diseased a tag bearing the words "U. S. suspect" is placed in the ear. This tag is numbered and a slip is made out to correspond and containing the suspected condition and then these animals are brought in, either before or after the regular kill, and in the presence of a veterinarian are killed and subjected to a thorough examination. Several conditions that do not show up very pronounced on autopsy will show quite a few symptoms of being diseased when examined antemortem. This inspection also prevents the spread of many diseases by cattle being shipped from one part of the country to another part of the country, and the laws of the various states regarding the interstate

shipment of cattle will also greatly aid the government in its work. The government is doing all in its power to check the spread of tuberculosis among dairy cows. It has been the practice during the last several years for unscrupulous persons to buy up the reactors to the tuberculin test in the large dairy districts and then get some unprincipled veterinarian to make out a fraudulent certificate of the tuberculin test and in this way sell the cows to innocent purchasers as sound and healthy. This has become so common in the Elgin district in Illinois that several states have prohibited the importation of cattle from Illinois unless they have been tuberculinized by Federal inspectors.

The Federal meat inspection at first was a very difficult task and nowhere near reached its present standard of excellence. It took quite a long time to get a system of inspection that would meet requirements and besides the appropriation made by congress was not nearly enough to carry on this work. The same may be said of the department now, they lack money to carry out plans as they would like to do them. In the beginning of the inspection the majority of the slaughter houses were very insanitary and poorly constructed, but since the packers have begun to realize how valuable it is to have a modern, sanitary plant, they have built some of the most modern and sanitary abattoirs in the world. The United States veterinary inspectors are invested with police rights around an abattoir that is under Federal inspection, and everything must be kept in a sanitary condition according to the regulations and disposition of all diseased carcasses or parts of carcasses must be carried out according to the best judgment of the veterinarian, according to the regulation, and if this is not done the packer dares not ship anything out of the state where he may maintain an establishment.

Each and every one of the large cities have great need of municipal or city inspection, not only for its meat supply, but also for its milk supply, and also for its other food products. Around these cities there are always butchers and dairymen who have no regard for the welfare of consumer, and will resort to any and all kinds of fraudulent practices if it will gain them anything financially. These kind can only be made to do what is right in the way of putting a pure and wholesome product upon the market by the law as it is brought to bear upon them through the efforts of a competent inspection. Another thing common to small slaughter houses is the fact that they are nearly all very insanitary and lack the proper modern equipment with which to make anything like sanitary slaughtering possible. These plants do only a local business, and for this reason they are not compelled to comply with the United States Department of Agriculture regulations, which require meat shipped interstate to be inspected. If it were possible to have city inspection you see that these dangers could be obviated. I do not mean to infer that the small butcher would knowingly place diseased meat upon the market, but not having a professional training, one could not expect that he should be able to judge where the decision was close, and it is reasonable to suppose that where the owner is involved financially, that he would take the benefit of the doubt himself.

Since the government has regulated the meat inspection, such cases as the following are condemned: septic wounds, cases of recent parturition, those making preparation to give birth to young, emaciation, broken bones or recent injuries accompanied by fever, extensive bruises and other that I might name, are condemned. Before

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Spare-Time Dissection for the Practitioner*

By BURTON R. ROGERS, Dean St. Joseph Veterinary College

MANY young men taking anatomy have expressed to me an earnest intention of preparing a dissection subject and doing a pile of dissecting during vacation when they return home. I have no doubt that many graduates and present practitioners made the same vow, either verbally or silently, when they were in school.

In spite of all these vows, I doubt very much whether any student or practitioner really ever did so. The possibility that the cause might be due to the absence of literature on the matter giving definite practical instructions as to how to prepare a subject and how to carry out a practical plan of dissection, suggested to me offering this subject and paper to this association and the veterinary press.

Furthermore, the proper preparation and preservation of dissecting material is one of the most important problems in the proper presentation of the important foundation subject of anatomy.

It seems to me the members of the veterinary profession engaged in teaching should get together and confer, as do the other branches, and discuss these matters for the benefit of the whole profession. The writer has almost continuously taught anatomy and demonstrated dissection for more than eight years, and am glad to say that he has never yet tired of the subject. Just a few months ago, I made an accidental discovery that I hope may be of value to teachers, students and practitioners, both human and medical.

Dryness and decomposition are the enemies of the dissector. If one uses too weak a solution of formaldehyde, the material spoils and decomposes before one can finish a thorough careful dissection. On the other hand, if one uses too much formaldehyde, the material dries out too rapidly and the parts cannot be readily separated, dissected and identified. Covering with damp cloths frequently results in the formation of molds.

When the veterinary building of the Kansas State Agricultural College was planned and built in 1907, the writer felt that if the packers could preserve meat in brine solutions, that formaldehyde injected, dissecting material could be similarly preserved. We consequently had a large concrete brine tank built, into which the legs and heads and smaller parts were suspended by means of sash cord and pulleys attached to the ceiling above, and then immersed, to be pulled up later and allowed to drain. This worked quite satisfactorily, but the trunks of the horses could not be placed therein, as it would require too many large tanks. Because the parts that were left out of the tank would dry up so fast, I frequently vowed I would some day inject a horse with four or five gallons of pure kerosene and try it out, but I never got around to it.

We recently had our janitor at the St. Joseph Veterinary College oil our floors with a mixture of equal parts of kerosene and pale paraffin oil, the latter costing less than fifteen cents per gallon. He had some floor oil left over and I had him paint over some recently exposed dissection areas and surfaces and cover them with oiled cloths. To my surprise I found that the parts were in as good shape as I had left them several days before. Later we tried pure paraffin oil without the kerosene and found it worked even better. We now constantly paint and keep every old and newly exposed part moist with paraffin oil. The muscles and nerves and other structures retain their flex-

*Read at meeting of the Missouri Valley Veterinary Association, Kansas City, Mo.

ibility and softness, do not decompose, or smell, or dry out. More formaldehyde can be used and none of the material need be covered with cloths or immersed. They can be hung up or exposed to the air with very little change.

I really believe many practitioners would enjoy it and at the same time increase their ability and dexterity as surgeons, if they would properly prepare a dissecting subject along the lines I am about to describe, and dissect the head and neck or the limbs or even the thorax and abdomen. Personally I believe there is only one way to properly learn anatomy or the structure of the horse, and that is by dissection. Years of lectures and reading will not accomplish what a few weeks of dissection will. I firmly believe there is only one book on equine anatomy that will properly guide the teacher and student, and that is M'Fadyean's Dissection Guide, one of the good old books, that I regret too few teachers of anatomy and dissection have given a thorough trial, and therefore do not realize its great value.

M'Fadyean gives definite, clear instructions regarding just what parts shall be examined and how they shall be exposed and isolated, in an exact order. If one treats M'Fadyean right, and accurately follows every step and direction that he gives, there will not be a single thing in the entire horse that the dissector will miss. So one of the first steps is to purchase a M'Fadyean's Dissection Guide if you do not already possess one.

The Kind of a Horse to Choose for Dissection

Get the smallest normal horse you can purchase, because they are so much easier to handle and take up less room. Age does not matter, but it is best to choose a horse in good condition if possible, but not too fat. A small amount of fat distributed through the tissues has a slightly preservative action and helps to keep the tissues softer and more natural.

For each subject, purchase one and one-half gallons of formaldehyde; thirteen to fourteen pounds of common starch, and some red coloring matter. Say a couple of bottles of red ink. Use your rectal injection pump or a common spray pump. Take two pieces of glass or metal tubing, preferably brass, and about one-quarter of an inch in diameter and about eight inches long. It is best to bevel them and round them at one end, so they will enter the carotid artery without injuring the wall of the artery. File grooves along the surface so as to help clinch the ligatures and hold the tube in the artery. Have two pieces of rubber tubing by means of which both tubes can later be connected to the smaller branches of a "Y" tube, and another rubber tube to connect the other branch to the pump.

Cast the horse, preferably upon the left side and with English hopples. Expose and isolate the carotid artery, preferably in the lower third of the jugular furrow, and for a length of six to eight inches, being careful not to wound lateral innominate branches. Ligate or use the artery forceps at the lower and upper limits of the exposed portion of the artery, stripping the blood out of the area first. Pass a thin smooth flat stick under the middle of the exposed artery, cut down on the artery on to the wood, transversely severing half the lumen of the artery nearest to the heart and tie it in tightly. Attach a long rubber tube leading to a pail. Remove the ligature and allow the animal to completely bleed to death. It is best to do all of this without having a drop of blood get on the ground or floor. While the animal is bleeding, prepare the injection material so as to be ready for immediate use as soon as the animal is dead. Delays result in rigor mortis that may bring pressure to bear on vessels and prevent a good injection. In such a case it

would be better to allow rigor mortis to pass off. Put one and one-half gallons of formaldehyd in the spray pump can and cover so as to prevent evaporation and injury to your lungs. Have two and one-half gallons to three gallons of hot water ready to add to the formaldehyd. Gradually pour the thirteen to fourteen pounds of starch into two gallons of luke warm water and thoroughly mix and then add the red ink. Keep stirring. As soon as the animal is dead lift the two upper limbs and spread the legs apart so that when rigor mortis sets in there will be room to dissect between the limbs. Extend the head and open the jaws, pull the tongue out, and straighten the tail; if a male, it is best to pull the penis out and tie it to a fore leg. If the sub-parotideal region is considered of more importance than the mouth or tongue, it is best to keep the mouth closed. Pass the other tube toward the head and connect both tubes to the pump and through the "Y" tube.

Add the hot water to the formaldehyd and rapidly pump it into the carotid both ways. Immediately follow the formaldehyd with the starch suspension, forcing the hot formaldehyd into the capillaries where it does its preserving work and then on into the veins. If there is a little blood in the veins, the formaldehyd will harden and leave them darkly injected, and thus assist in their dissection. One might even send in about four pounds of blue starch with the first gallon of formaldehyd. If too much starch suspension is used and too much force is used, a thoracic vessel is liable to be ruptured and the whole injection fail, some horses are more liable to do this than others. The upper side of the head and neck will always be well injected.

Now ligate or compress with artery forceps the carotid above and below, remove the brass tubes and wash the pump immediately.

Completely paint and cover the entire horse with paraffin oil, thoroughly soaking the hair. The oil will evaporate very slowly, if at all, and dissection can be begun as late as desirable. If such a subject has the proper angle of limbs, it will stand alone indefinitely in a nearly natural position.

M'Fadyean divides the subject into four parts, the beginning being with the animal on its back, one group on the lower part of the neck—one on the pectoral region—one on the abdomen, and one on the inside of the hind legs One man can take the abdomen first and then any of the others he may choose, or he may dissect off the limbs and the head and neck and leave the abdomen and thorax. Other things equal, it is best to choose the under limbs, for they are usually the best injected.

Or one may immediately suspend the animal in the natural position. Bore a hole transversely from one internal angle of the ilium to and through the other one. Bore another hole mesially and longitudinally through the supra-occiput at the poll and at a tangent to the cranial dura-mater, using a wood, not an iron, drill. Use common galvanized telephone wire and suspend to the ceiling. One can dissect the head and limbs off in the upright position. The head and neck alone is an enticing dissection and one can just cut off a head by cutting straight through the third or fourth cervical vertebra. Drive wooden plugs into the spinal canal and into the two vertebral or transversaria foramina. Ligate one carotid artery and both jugular veins, unless you desire to wash the blood out of the vessels. Insert the tube of the pump into the carotid and inject toward the head, first with formaldehyde, then with starch.

A head or a limb would not take up much room in the office, and in the dull summer or winter months you would

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THE VETERINARIAN IN RELATION TO THE PUBLIC HEALTH

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inspection it is safe to presume that a great many such cases were placed upon the market and sold, and that the same thing is still being done in the small slaughter houses that have no inspection.

Tuberculosis is one of the most common, and also one of the most dreaded diseases of cattle and of the human as well. I do not think that one unfamiliar with the prevalance of tuberculosis of the food producing animals can realize how common it is. It has been proven without doubt that tuberculous cows contaminate the mangers and stalls, and also that they pass the infection with the feces, so it is easily understood how milk may become contaminated with the particles of dust and dirt that may gain access to the pail during the milking period. It is also true that many cows have been known to eliminate the virulent bacilli in the milk.

The British Royal Commission, in its report of 1911, recognized the three strains, human, bovine and avian. The first two only concern us. The great authorities of the world have come to the conclusion that tuberculosis may be contracted by the human being through infection with the bovine bacilli. It is a recognized fact that children may contract the disease from the bovine type of infection, as some of the following reports will show: From the Research Labratory of the Department of Health of New York City: Of 368 cases in children under five years of age, seventy-six were caused by the bovine bacilli; this is 21 per cent. Of thirteen cases of abdominal tuberculosis in children under five years of age, ten were due to the bovine type. Of thirty cases of generalized tuberculosis of alimentary origin, fourteen were due to the bovine bacilli.

It seems very strange indeed that people of education, and especially those who have medical training, in spite of all the carefully worked out case reports and the statistics that are available, would even entertain the probability of an error. Circumstantial evidence has been proven so strongly in some of this work that it would be enough to convince any but the most skeptical.

Does it not seem that, knowing as we do, the dangers that surround the people, that are directly or indirectly the result of the unhealthy conditions of the food-producing animals, that we who are so intimately associated with them, should do all in our power to remedy these conditions. This can only be done by education by showing, as nearly as possible, the exact conditions. This can only be done through the press, public addresses and public demonstrations. It seems to me, then, that there are none of us who are doing our whole duty to our fellow man.

From the statistics and reports that are available, we learn that the majority of fatalities that may be directly attributed to the products of the animal kingdom, of which milk is the chief, occur in infants under five years of age. Does it not seem that we to whom mother is a sacred word, owe it to those mothers who find it necessary to rear their young on the cows' milk, to do all in our power to make this product as pure and wholesome as possible, and in this way be instrumental in assisting that mother to rear her child to manhood or womanhood, rather than see it cold in eternal sleep. If we were able to prevent the sorrow and anguish that would otherwise fall to the lot of some mother, do you not think that we would have done more in the sight of Him who does all things well, than many an individual whose name has gone down in history as the hero of his age?

AMERICAN JOURNAL of VETERINARY MEDICINE

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Subscriptions from the United Kingdom should be sent to our London office in care of Messrs. Bailliere Tindal & Cox, 8 Henrietta Street, Covent Garden, London, England.

The 1915 A. V. M. A. Meeting

AS foretold last month, the ballot to decide whether Kansas City or San Francisco should entertain the next meeting of the American Veterinary Medical Association was indecisive, and the executive committee has decided that the meeting shall be held in California. The local committee on arrangements has selected Oakland as the place of meeting and the week beginning August 30th for the date. There is a ferry from Oakland to the Exposition grounds and it is quieter there than in Frisco, and for this reason more desirable for the convention. Better hotel accommodations can be secured in Oakland during the week beginning August 30th than either immediately before or after that date.

No factional differences exist among the veterinary profession of California, who are united to a man in the determination to make the next meeting the greatest one that the A. V. M. A. has ever held. With the wonderful attractions in side trips and the international exposition now in progress, coupled with the further fact that the association has not held a meeting for two years, the ambition of the Western veterinarians to make the next meeting eclipse all former gatherings should be easily achieved. It would appear that no veterinarian who can afford it, and few veterinarians cannot afford it, will forfeit the pleasures and educational advantages to be derived from this combined visit to the world's greatest exposition and to the A. V. M. A.'s greatest annual meeting, with the further advantage of having enroute, both going and coming, the finest natural scenery on the continent.

The attendance at local veterinary meetings throughout the region affected by the recent epizootic of foot-and-mouth disease has been much increased by this epizootic, and the interest of those attending as well as the quality of the programs has been improved. This veterinary awakening should have an even more favorable effect on the great international veterinary meeting to be held next August.

As the journey from the section of the country in which three-fourths of the veterinary population of the country live is a long one occupying several days, there will be many advantages in parties of friends traveling together to this meeting. It is none too early for congenial parties to begin to make their arrangements for the trip and for such side trips as may appeal to them. Parties of 125 or more may secure a special train, but ordinarily there is little advantage in this as the opportunities for social intercourse among those in different cars in the same train are limited, and there are always many disadvantages

that arise from the variety of tastes that are bound to obtain among parties of this size. Practically all of the good-fellowship and social intercourse that can be secured on a special train, can be enjoyed in one or two special cars, and it is much easier to find the number requisite for a special car with similar likes and dislikes than it is the larger number required for a special train. However, the matter of a special train, at least from Chicago on, is being considered. The round trip fare from Chicago is $62.50; Pullman, $13.00 for lower, $10 for an upper; tourist sleeper $7.00 for a lower, $5.60 for an upper each way.

Four Illinois veterinarians are already planning to make the trip in automobiles, provided they can induce at least an equal number to join them so that the party may be larger. This, of course, offers the maximum of opportunity to see the country and enjoy it, but the trip is long, somewhat arduous should any bad weather be encountered, and more expensive in time and money than the trip by rail.

Here's hoping that the next meeting of the A. V. M. A. will set a new standard to work by in planning any future meetings.

OUT OF THE DAY'S WORK.

It goes without saying that we never get enough good practical discussions and interesting case reports. I believe every reader realizes that we want more of these for publication, and most readers, I am sure, realize that they ought to send in more of this kind of material than they do. I haven't much complaint to make though, because readers of VETERINARY MEDICINE are more alive to the importance of placing on record things of real practical value, than the readers of other veterinary publications; but considerable matter is received for publication that we cannot use—matter that really should not be sent in.

Some apparently think it is sufficient to relate the main facts or the end results without the collateral facts that go to make the report worth while for others. When sending in a case report, the writer should always give the obtainable history as far as it has a bearing on the case. He should give the symptoms and the diagnosis, and if the symptoms are unusual or the diagnosis somewhat far fetched, he should give briefy what he believes has given rise to the peculiar symptoms or what has influenced him in making the diagnosis. The treatment, of course, should always be given. Ordinarily, not only the drugs used should be mentioned but the size and frequency of the dose should also be given, and, of course, the outcome should be stated and the results of the autopsy where one is held.

The following letter to one who has complained because a former article was not published, is about the kind that we usually write to those who desire to exploit their skill in VETERINARY MEDICINE without giving any information as to how they have obtained their results or any other information of any kind that could benefit readers. This letter was written to a veterinarian, a good friend of the Journal, who insisted that we publish the fact that he had cured 500 cases of fistula of the worst type by giving the animals in their feed a medicine which he has. We want case reports and want them badly, but we want reports that have in them a lesson for the reader.

Dear Doctor:

Your letter is at hand, in which you recount your success in treatment of fistula and poll evil, and in which you incidentally mention that you wrote me an article a year ago which was not published. I don't remember your former article, but if it was like this one, no wonder it was not published.

If you will consider what you have written for one minute, you will realize that it is of no value for publication. What good will it do any practicing veterinarian to read that you have a medicine (not named) that will cure fistula when given in the horse's feed? If you will state that such and such drugs given in the horse's feed act in such and such ways and bring about a recovery from fistula and poll evil in a reasonably short time, then we should have something in which readers might be interested. Some might want to try

it and benefit by it. I am sure you would be one of the first to kick if I used up the valuable space, limited as it is, in VETERINARY MEDICIINE for saying that Joe Smith, Jim Jones and John Johnson were able to cure this, that or the other ailment, and had done it in so many cases, without giving any information that would help others to do the same.

I believe you are a reasonable man, and that on consideration you will realize how useless a journal filled with matter such as this would be.

Very truly yours,
(Signed) D. M. CAMPBELL,
AMERICAN JOURNAL OF VETERINARY MEDICINE.

Here is another reply to a good doctor out in Iowa, who objected to the articles we published from men of limited experience and because we did not publish more articles from men of long experience.

He had not seen any of the books of the "Veterinary Medicine Series," but all the same he questioned their usefulness. He objected to some of the advertising carried as being articles of no use to him and questioned their usefulness to anybody. In short, it was a letter full of kicks from the first line to the last—all destructive and none constructive. Apparently the reply satisfied him for he renewed his subscription without further comment.

Dear Doctor:

I have been much interested in your comments on the JOURNAL. I wish that you might be in my place for a few weeks and get a little experience of a kind that your long practice in the veterinary profession has never furnished you, that is, some experience in trying to get the men who have been in the field twenty years to write an article for publication. Many such men, in the first place, are too busy to give much attention to anything but their work. In the second place, they have become somewhat rusty on anatomy, physiology, and particularly on pathology and bacteriology, and they hesitate to write an article for fear they might make some break which the young man just out of college would be apt to ridicule. Of this, however, there is no danger, since errors of this kind, if they did occur in the manuscript, would be corrected before publication.

It is all very well to talk experience. Experience to the man who has the basic foundation to understand it is the most valuable thing in his mental equipment for practice, but at the same time there is a whole lot of things of great value in veterinary practice taught in the veterinary colleges of today that were not taught twenty, fifteen or even ten years ago. I appreciate the force of what you say about experience, but at the same time I am equally certain that the young graduate can tell the man of twenty years' experience a good many things that will be of advantage to him, and I assure you from this end it is a great deal easier to get the young graduate to do it than it is to get the experienced man to loosen up.

I take it you are joking about the books. You must be perfectly aware, as every reader must, that the series of books called the "Veterinary Medicine Series," of which "Springtime Surgery" is one, "Colics and Their Treatment" another, "Poultry Diseases" third, Steffen's "Special Veterinary Therapy" fourth, "Swine Diseases" a fifth, and so on, are made up largely of articles which have been published in the JOURNAL—articles which were of such unusual value that a great many readers wanted to have them in permanent book form for easy reference. These, or any other books sold by the AMERICAN JOURNAL OF VETERINARY MEDICINE, may be returned by any purchaser if he is not satisfied with them, and his purchase price will be refunded.

As to the advertisements, it is not expected that any one man will be interetsed in all of them. I am quite sure that no other publication censors its advertising any more closely than we censor ours, and I am positive that no other veterinary publication censors it anywhere near as closely. Other American veterinary publications have continually carried advertising that was refused by this JOURNAL.

Very truly yours,
(Signed) D. M. CAMPBELL,
AMERICAN JOURNAL OF VETERINARY MEDICINE.

BULLETINS EVERY VETERINARIAN SHOULD HAVE.

The Action of Arsenical Dips in Preventing Tick Infestation. By H. W. Graybill, U. S. Dept. of Agriculture. Reprinted from the Journal of Parasitology, September, 1914.

Stock Poisoning Plants of California. By Harvey Monroe Hall and Harry S. Yates. Bulletin No. 249, Agricultural Experiment Station, Berkeley, California.

Brisket Disease (Dropsy of High Altitudes). By Geo. H. Glover and I. E. Newsom, Experiment Station, Fort Collins, Colorado.

Twenty-seventh Annual Report of the Purdue University Agricultural Experiment Station, Lafayette, Ind., for the year ending June 30, 1914. This report contains a complete record of the hog cholera serum production, hog cholera investigation, investigation of hog cholera remedies and cures, and the test of commercial hog cholera serum by the veterinary department of the station during the year.

Foot-and-Mouth Disease in Illinois. By experts before the Illinois General Assembly, January 19, 1915. Compiled and printed by the Secretary of State, Lewis G. Stevenson, Springfield, Ill.

This is one of the best official documents yet appearing on the subject of foot-and-mouth disease. It contains the addresses of Gov. E. F. Dunne, Mr. W. R. Goodwin of the *Breeders Gazette*, Dr. V. A. Moore of the New York State Veterinary College at Ithaca; Dr. C. J. Marshall, State veterinarian of Pennsylvania; Dr. S. E. Bennett, B. A. I. inspector in charge of the foot-and-mouth disease eradication in Illinois; Dr. U. G. Houk, B. A. I. inspector in charge of the eradication work in Michigan, Mr. G. A. Gregory, Editor of the *Prairie Farmer*, Chicago, Mr. H. E. Young, editor of the *Farmers Review*, Chicago, and Mr. J. R. Brown, editor of the *Farmers and Drovers Journal*, Chicago. In addition to this it contains a record of the appearance of foot-and-mouth disease on something more than 700 farms in Illinois.

Notes of the Hog Cholera Conference at Purdue University, Dec. 18, 1913, Circular No. 48, Purdue University Agricultural Experiment Station, LaFayette, Ind.

First Biennial Report of the Oregon State Live Stock Sanitary Board for the year ending Nov. 30, 1914. State Printing Department, Salem, Oregon. This is essentially the report of Dr. W. H. Lytle, Secretary of the Commission and State Veterinarian. It is a very interesting pamphlet, containing a brief discussion of most of the diseases occurring in Oregon sheep and of animal losses due to diseases in Oregon.

NEW VETERINARY BOOKS.

The following books of interest to veterinarians have recently been placed on the market. They will be reviewed in these columns next month or the month following.

The Anatomy of the Domestic Animals by Septimus Sisson, S. B., V. S., with 725 illustrations, many in colors, second edition, entirely reset, W. B. Saunders Co., Philadelphia. Price $7.00.

Pathogenic Micro-Organisms, A Textbook of Microbiology for Physicians and Students of Medicine, by Ward J. MacNeal, Ph. D., M. D., with 213 illustrations, P. Blakiston's Son & Co., Philadelphia. Price $2.25.

The Doctor, His Book of Poems by Frank P. Davis, M. D., Frank P. Davis, M. D., Publisher, Enid, Oklahoma. Price $1.00.

Canine Medicine and Surgery by Chas. G. Saunders. Published by the AMERICAN JOURNAL OF VETERINARY MEDICINE, Evanston, Ill. Price $2.25.

Dairy Chemistry: A Practical Handbook for Dairy Chemists and Others having Control of Dairies, by Henry Droop Richmond, F. I. C. Second Edition, Revised, with numerous tables and 49 illustrations, J. B. Lippincott Co., Philadelphia. Price $4.50.

A Laboratory Manual and Text-book of Embryology by Charles Williams Prentiss, A. M., Ph. D., with 368 illustrations, many of them in colors. W. B. Saunders Co., Philadelphia. Price $3.75.

Practical Bandaging including Adhesive and Plaster-of-Paris Dressings, by Eldridge L. Eliason, A. B., M. D., with 155 original drawings and photographs. J. B. Lippincott Co., Philadelphia. Price $1.50.

Department of Surgery

By L. A. MERILLAT, Professor of Surgery,
McKillip Veterinary College, Chicago

The Treatment of Wounds

(*Continued from March Number*)

Preoperative Wound Treatment,

THE operations in which there is an especial need of weighing carefully the vigor of the patient to forestall disaster are more numerous than might at first be supposed. The more common ones are:—

1. Radical operation against poll-evil;
2. Radical operation against fistula of the withers;
3. Ablation of schirrous cords, botryomycomata, shoe-boils; goitres, nasal tumors, eye-balls, etc.;
4. Radical operations for large hernia-ventraloceles, oscheoceles, and exomphaloceles;
5. Cryptorchidectomy;
6. Operations upon infected tendon sheaths and articulations;
7. Surgical treatment of large lacerations of the buttocks and shoulders;
8. Surgical treatment of abdominal wounds with visceral injury;
9. Amputations following serious accidents.

A review of these procedures, and there are many others, shows clearly that major operations of a serious character—serious on account of the magnitude of the traumatism—are indeed numerous. They include the surgical operations of animals that are actually worth the trouble and expense entailed in their performance and after-care, because the salvage is always considerable and in most cases amounts to the full value of the individual afflicted. The existence of animal surgery therefore depends very largely upon our ability to work out plans of wound treatment that will carry such patients safely and promptly through the period intervening between the completion of the operation and the final cicatrization of the wound. In short to make animal surgery actually worth while we must make, and then manage, large wounds better than we have done heretofore.

In the last article we endeavored to show that the initial fault is the lack of effort we make in the pre-operative examination of our surgical subjects. To wade recklessly into a patient before weighing carefully its ability to bear the effect of the traumatism we are about to inflict seems to be a sin we continue to commit. In view of the other obstacles under which wound healing in animals must proceed it is plainly important to start out with the best physical condition it is possible to produce. Every means at our command should be drawn upon to accomplish this end.

I shall repeat that our best surgical subjects are those well cared for, well

fed and worked enough to keep them muscular, and the poorest risks are those badly fed, worked hard and housed in poorly ventilated stables. To the latter may be added animals sick and enfeebled from the disease for which they are to be operated upon. The former stand surgery well while the latter are victims of complications. The former need only a preparatory dieting to avert operative accidents while the latter are seldom fit for major surgery until the lost vitality has been restored. A physical examination for pulmonary, cardiac, digestive and locomotory disorders is particularly demanded. Urine analysis, blood counting and bacteriological tests of discharges and secretions are less called for in animal surgery and in fact are only seldom of sufficient importance to warrant one in resorting to them but the knowing animal specialist comes to conclusions about the physical condition of his patients by their general appearance and the lives they have previously led.

The Cost of Better Wound Treatment

The question of cost always enters into any detailed desertation on surgical operations. It is usually thought imprudent to add still more to the already high overhead expense of our surgical work. To eliminate the necessity of referring to this feature again we shall state flatly that the actual value of our surgical operations is not reflected in the prices in vogue today. The veterinarian should make them more valuable by doing better work. This is the pure and simple solution of the ridiculously low prices we receive for our surgical services. A scale of prices should be an elastic scale. We must do what the surgeons of humans do; operate upon the poor for nothing and claim a reasonable fee where the cost is less an object. In veterinary surgery we should operate upon cheap animals for less than upon those where the salvage is great. Five, ten, fifteen or twenty dollars may be ill-spent for an operation that ends unsuccessfully or in a long convalescence; while twice these amounts for operations that promptly restore useless animals to their full value wonld be regarded as good investments.

Operations upon cheap animals, done with a thoroughness that makes for good results, will always amply pay the surgeon in experience if not in money; and this experience can always be turned to good use when conditions are more favorable for the collection of a good fee. Any attempt to arrange prices on any other basis is designed to fail to adjust our grievences in this connection. It is becoming more and more evident that better surgery offers us the best opportunity to increase our incomes.

A Few Words on Asepsis

The plans for preventing the contamination of wounds while making them or while treating those accidentally inflicted, have revolutionized the surgical art. Today the surgeon must work religiously throughout an operation to prevent the soiling of tissues with infection, and this has greatly complicated surgical technic. The mere cutting process is often a much simpler process than that of preventing the open tissue from becoming contaminated with pathogenic bacteria. Surgery includes today not only the classical incisions, resections, dissections, etc., but also a complicated pre-arranged plan of doing these without depositing harmful bacteria into the trauma. The fact that bacteria are harbored upon and within all objects directly and indirectly connected with the procedure, calls for preventive measures that are by no means easy to carry out. The prevention of operative infection requires knowledge of bacteriology and pathology that is not possessed by the charlatan, and it is here that the educated practitioner can

find the greatest weapon to use against his charlatan competitor.

There is a certain definite number of objects that touch wounds, and aseptic surgery might be correctly defined as the art of preventing these from inoculating bacteria into them.

The air, the instruments, the surgeon's hands, the assistant's hands, the surgeon's clothing, the assistant's clothing, the operating place, the sponges, the solutions, the containers of solutions, the sutures, the dressings and bandages, the surroundings of the wound (surgical field) and the patient's habitat include all of the objects capable of conveying infections. Aseptic surgery dictates a rigid handling of all of these objects. None must be ignored; each must be made absolutely harmless or at least as near harmless as is possible and practical. To make a sane effort to prevent wound contamination from each of these conveyors in every operation is a modernism that should no longer be neglected in veterinary practice. The methodical handling of these to this end, in a surgical operation is an exhibition of knowledge and of skill; a spectacle deserving of praise, that is sure to win applause from intelligent judges; and a means of accomplishing the best results. The veterinarian should realize there is also a legal side to this question; that he may be made accountable for infections of his own making, when precautionary measures have been disregarded.

Air as a Conveyor of Infection

Except where patients can be taken out into the open, on a clean grass plot away from the dust of trodden corrals, roads or tilled fields, the air is capable of conveying dangerous infections. The air itself acts only as a carrier of particles which in turn carry bacteria. When there are no particles suspended in the air it is harmless, when it is laden with suspended or flying particles it must be reckoned with, and is probably more often the source of mysterious wound infections than we at first supposed. In my earlier teachings I was inclined to make light of the possibilities of wound infections from this source just as the surgeons of humans were doing after they demonstrated the fallacies of Lister's historical "phenicated cloud." But a wider experience has taught that the air of stables and especially veterinary hospitals is quite different from this standpoint than that of hospitals for human beings. While it is no doubt a fact that most of our infections come from other sources the air of our operating rooms is not to be entirely ignored. They are usually dust laden and the dust originates from badly contaminated floors, and even when measures are taken to allay dust the room may become re-contaminated around the surgical field with dust raised from the patient's body. The body of a struggling animal may thus become a veritable pest. Dust and hairs loosened by struggles and then whirled about by drafts very often create very dangerous conditions and are often difficult to manage. We would be making a very poor start toward perfection in aseptic practice were we to continue to disregard these dangers.

Refined nosocomial work demands especial care to allay suspended room dust by spraying and to prevent the raising of dust by mopping and flooding floors instead of sweeping, and by wiping furniture and utensils instead of dusting. When these precautions have been taken the patient itself might be brought in well groomed and moistened with a damp cloth to reduce to the minimum the amount of dust raised from the body. This latter recommendation is particularly important around the surgical field. These environs may even be well soaked with water.

For the out-of-door operation the trodden corral and tilled field are particularly dangerous, for the dust from these sources are ridden with bacteria

of the most harmful sort, and usually there is wind to whirl about the particles raised by the patient's struggles. Youngsters, either equines or bovines, shedding the long shaggy winter coat are about the most miserable surgical prospects imaginable. Great clouds or even bunches of hairs are sometimes swept into wounds in operations upon such animals and if there is added to this the dust from a bare paddock the condition is abominable and strictly unfit for any kind of surgical work. The use of any kind of litter as an operating bed may likewise be condemned. There is no fit litter for surgical work. A ban might as well be put on all kinds of loose beddings used to make a soft place for restrained animals to lie upon during operations, for it is positively impossible to maintain a decent state of surgical cleanliness with loose particles whirled or trailed into or near the wound at every moment. Whenever the weather is too inclement for out-of-door work it is better to cast animals upon a bare floor, protecting the head and hips with blankets if thought necessary. The actual difference between a bare floor and a floor bedded with two or three inches of straw is not great, measured from the standpoint of the patient's comfort. Beddings are usually pushed aside and the body rests upon the floor before the operation is very far along, and about the only good accomplished by the bedding is the pschycological effect it has upon the audience. Shavings properly moistened can be controlled better than any other bedding but these are seldom available and are none too safe. It is better to abandon entirely the use of litter as a surgical appurtenance and thus dispose of one of the sources of air contamination.

In short, air is a prolific source of wound infection in animal surgery that should be dealt with consistently. It is not as dangerous as Lister taught before the days of bacteriology, but more dangerous for veterinarians than for the surgeons of humans, who operate under much more favorable conditions than it is ever possible for us to do.

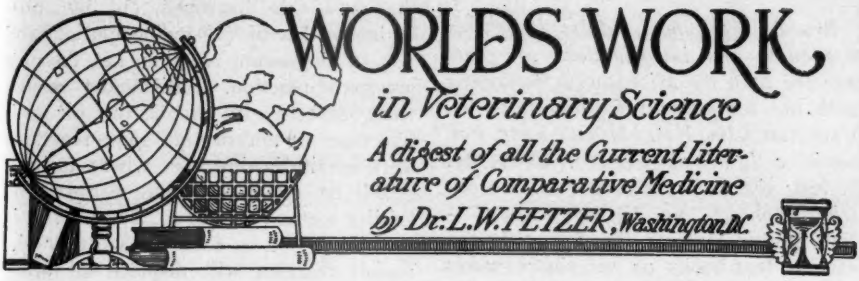
Instruments as Conveyors of Infection

As instruments come into such direct contact with wounds they are more certain to innoculate them than the other objects used in wound treatment. The metallic instruments used in surgical work (knives, forceps, etc.) become progressively more dangerous day after day unless submitted to an effectual sterilization. That is, instruments used from the pocket case or from shelves of the instrument case soon become very dangerous. They will infect every raw spot they touch with appalling certainty.

Wound infection from this source is avoidable under all circumstances as well in veterinary as in human surgery and should therefore be entirely eliminated. There is absolutely no excuse for wound infection from instruments. They can and in fact should be sterilized before every operation and then handled during an operation so as to prevent them from becoming contaminated. Veterinarians who continue to operate without first sterilizing their instruments are fortunately fewer than formerly, but I regret to say they are still legion.

Boiling is by far the easiest as well as the safest methods of making instruments safe. Metallic instruments should be boiled ten to fifteen minutes to assure safety. Cutting instruments are harmed somewhat from repeated prolonged heating. These may be removed from the boiling water after two or three minutes of boiling and then immersed in alcohol. Our present plan is to pick up the knives from the boiling water after two or three minutes and complete the sterilization by placing them in a jar containing denatured alcohol. Alcohol sterilization for scalpels and bistories is depended

(*Continued on page* 272)


WORLDS WORK
in Veterinary Science
A digest of all the Current Literature of Comparative Medicine
by Dr. L. W. FETZER, Washington D.C.

Anatomical, histological and bacteriological investigations of eleven cases of canine tuberculosis, H. SCHORNAGEL (*Inaugural Dissertation, Berne,* 1914).—Much of the work reported in this dissertation was performed in the Pathological-Anatomical Institute of the Government Veterinary School in Utrecht, Holland. Of 568 dogs which came to autopsy eleven were found to be tuberculous. The mesenteric glands were the most frequently affected and these were followed by the lungs, bronchial glands, pleura, liver, mediastinal glands, neck, and spleen. Infection of the peritoneum, mesentery, pancreas and kidney were only found once. Generalized acute miliary tuberculosis was present in three cases. In eight cases the tuberculosis was either the cause of death or the disease was so far advanced that the animal had to be killed.

Tuberculosis in the dog, i. e., the anatomical picture, is not similar to that noted in other domestic animals, excepting the cast. Tubercle bacilli were difficult to find in histologic sections and in no instance could giant cells be noted. Calcification was noted in one case. Of eight strains of bacteria isolated from dogs two belonged to the bovine type, four to the human type, and two were transitional forms. The dog must consequently be considered a source of danger to man.

Laboratory tests as a guide to inoculation treatment, J. FREEMAN (*Brit. Med. Jour., No.* 2706, *pp.* 1292-1294; *abs. in Centbl. Bakt.* [*etc.*], 1 *Abt., Ref., Vol.* 58, *No.* 2, *p.* 42).—A rational vaccine therapy cannot be based on clinical manifestations, i. e., fever, upon the constitution or the subjective condition of the patient, but only upon proper tests made in the laboratory. Much information can be gained from the blood picture of the patient after vaccination. The agglutinins need not be considered because they have no connection with the immunity produced, but good results may be obtained with the complement fixation test. The best criterion is the estimation of the opsonic index. The therapeutic dose is to be governed by the opsonic index. As an example of this a lethal case of glanders is cited in which the blood showed a marked rise in the opsonic index toward the *Bacillus mallei* at a time when there were no other symptoms of the disease present.

Tuberculosis of the bone marrow of a cow, HUB, *Munchen. Tierärztl. Wochnschr., Vol.* 57, *No.* 25, *p.* 487.—A cow which was lame for quite a long time in the right hind leg later ceased to use the extremity, and developed a cough. On slaughter it was noted that the marrow of the right front leg contained caseated tubercles. Other tubercular changes were present.

An interesting case of tuberculosis in the goat, L. GRUBER, *Munch. Tierärztl. Wochnschr., Vol.* 57, *No.* 14, *pp.* 281-284.—A 4-year-old breeding buck showed tuberculosis of the testicles, lungs, and

mediastinum. The viscera was free from tuberculosis.

Bruce's septicemia (Malta fever) as a zoonose and investigations of goats infected with the Micrococcus melitensis with the complement fixation test. G. VALLILLO, *Clin. Vet. (Milan) Rass. Pol. Sanit. e Ig., Vol.* 35, *No.* 19-22, *pp.* 70-986; *abs. in Berlin. Tierärztl. Wochnschr., Vol.* 29, *No.* 50, *pp.* 895-896.—The author laments the fact that the various text-books on veterinary medicine do not give sufficient consideration to this important disease which has wide distribution. It attacks man, goat, sheep, horse, ass, dog, cat, guinea pig, fowl, and duck. Its pathology and symptoms are considered in detail in the original article. The micrococcus, which has migratory characteristics, often leaves the blood stream and goes to the internal organs. This explains why the bacteriological examination at times gives negative results. Although more constant results were obtained with the Wright agglutination procedure when special notice was taken of the clinical picture the test is not infallible. Tests were also made with the complement fixation procedure with two artificially infected goats. The antigen consisted of strains of the *M. melitensis,* some obtained from man and others from goats. The results obtained compared well with those found with the agglutination test.

No conclusions are drawn. The methods whereby the disease is conveyed and prophylactic measures for guarding against it are discussed.

The present-day aids for diagnosing anthrax, FISCHOEDER, *Berlin. Tierärztl. Wochnschr., Vol.* 29, *No.* 36, *pp.* 640-643; 37, *pp.* 658-660; 38, *pp.* 675-678.—This discusses the occurrence and prevention of anthrax bacilli in the tissues and body fluids; the appropriate methods of shipping samples of pathologic tissue, etc., paper rolls, plaster pencils, tubes, etc.; and the methods for diagnosing anthrax, viz., (a) noting the presence of bacteria and their capsules in smears and the conditions under which the capsule is destroyed, (b) by cultivating the bacilli, (c) by inoculation, and (d) by the serum reaction, i.e., Ascoli's precipitin reaction. Satisfactory results were obtained with Ascoli's test for posifive cases of anthrax but some reactions were obtained with cases where anthrax could be excluded. The Schütz and Pfeiler method (E. S. R., 29, p. 378) is preferred. It is doubtful whether the Ascoli reaction will displace all other methods in use. It is stated, however, that when no positive results are obtained with either the smear or inoculation test the diagnosis must rest upon the findings with the Schütz and Pfeiler method.

The thermoprecipitation reaction in Malta fever, L. VIGANO, *Centbl. Bakt. (etc.),* 1; *Abt. Orig., Vol.* 70, *No.* 3-4, *pp.* 200-202.—The bacillary extracts used were made either by mixing a 48-hour agar culture of the *Micrococcus melitensis* with 25 cc. of physiological salt solution and allowing to stand for 24 hours in a refrigerator, or by placing in a boiling water bath for five minutes. The extracts were filtered through asbestos. The boiled extract, when brought in contact with a specific serum produced a characteristic ring almost instantly, while the reaction with the extract prepared in the cold took a somewhat longer time to occur. Extracts made from a variety of other bacteria showed negative when tested against specific serum. Extracts of the spleen, liver, kidney, heart, and cardiac blood of animals affected with Malta fever showed positive with the exception of the heart extract. The reaction occurred quickest with the extract from the liver and spleen. Normal horse serum, anthrax serum, and erysipelas serum showed negative with the organ extracts of animals infected with the *M. melitensis.* Negative results were likewise obtained with the specific serum and organ extracts from normal rabbits.

Materia Medica and Therapeutics

By DR. CHARLES F. LYNCH, Terre Haute, Ind.

Physostigmin

Commercial ether does very well given orally, as mentioned in "Colics and Their Treatment," but for anesthesia the pure product only should be used.

In the March issue of VETERINARY MEDICINE we considered the physiological action and therapeutic applications of jaborandi and its principal alkaloid pilocarpin. As pilocarpin and eserin have so many points in common both physiologically and therapeutically I consider this a favorable time to take up the consideration of eserin. As the spring months present many cases in which the use of pilocarpin or eserin are indicated, it would seem to make the consideration of these agents at this time the more opportune.

Eserin is an alkaloidal substance derived from the seed of physestigma venenosum or calabar bean. This alkaloid is also recognized in the pharmacopia under the name physostigmin. Calabar bean is derived from tropical Africa in the vicinity of the Calabar and Niger rivers. The drug is also known as the "ordeal bean" among the natives where it is used in the trial of natives accused of crime. The suspect is required to take a toxic dose of the drug by the mouth. If he vomits it he recovers and is not considered guilty. If he retains it he dies and thus justice is satisfied.

In addition to the alkaloid eserin or physostigmin liquid preparations of physostigma often contain a decomposition product known as calabarin. This substance is a powerful convulsant and is capable of producing a condition similar to that seen in a strychnin poisoning. Physostigmin is a very unstable alkaloid at best and unusual care is necessary in handling it to prevent its decomposition. For this reason it should always be purchased in vials containing just about the amount usually administered at a single dose.

Physostigmin is obtained from the crude drug by dissolving the alcoholic extract in water with the addition of a small amount of sodium bicarbonate. Ether is then added to the solution which is thoroughly mixed by shaking. The etheral liquid is then evaporated and the physostigmin remains behind. For practical use two salts of the alkaloid are on the market, viz., the salicylate and the sulphate. Salicylate of eserin is made by adding eserin to a boiling solution of salicylic acid. On cooling eserin salicylate crystallizes out as a colorless or faintly yellowish crystalline salt, odorless but with a very bitter taste. This salt is the most stable and resists decomposition better than the sulphate, but has the disadvantage that it is rather sparingly soluble in water, requiring about 73 parts of water. The sulphate which is made by combining eserin with sulphuric acid is a finer crystalline substance, which is very freely soluble in water, and for this reason is usually preferred to the salicylate, although it has poorer keeping qualities.

The dosage of eserin and its salts for the horse by the mouth is one to three grains, while subcutaneously it is given in dosage of one to one and one-half grains. It is sometimes given intratracheally in dosage of one-half grain. In foals and calves the dosage is one-twelfth to one-sixth grain. For the dog the dose by the mouth is gr. 1/60 to gr. 1/10, while subcutaneously the amount given is gr. 1/100 to gr. 1/30.

Action and Uses.

Applied externally the drug has little or no action except when instilled into the eye when it produces contraction of the pupil accompanied by some pain. This contraction is due to direct stimulation of the circular fibres of the iris and not to any action upon the oculomotor nerve. Eserin solutions also reduce intra-ocular tension, and after a primary stimulation of the powers of accommodation cause a spasm of accommodation.

Internal administration results in increased flow of saliva, increased gastro-intestinal secretion—not as marked, however, as under pilocarpin—and rapid profound stimulation of gastro-intestinal peristalsis with colicky pains, passage of large amounts of feces, mucus and flatus and audibly loud peristaltic movement. Toxic doses produce a tetanic spasm of the bowel muscles followed by a relaxation. Small doses repeated for a considerable period of time tone up muscular atony of the bowel and overcome tendency to constipation.

Eserin increases all the secretions of the body, including the lachrymal gland, mammary gland, bronchial mucous membrane and sudoriparous glands, as well as those of the gastro-intestinal canal. In small doses it slows the action of the heart, while toxic doses produce a rapid feeble pulsation. On respiration toxic doses have a depressant action, and death from eserin is directly due to asphyxia. In its action on the nervous system the main action of the drug is that of a depressant of the anterior or inferior cornua of the card. In toxic doses it produces paralysis of motor and sensory nerves.

The muscular system is more affected by this drug in the domestic animals than in man. All therapeutic doses cause tremor of the voluntary muscles followed by muscular relaxation and weakness. It is upon its ability to produce the profound muscular relaxation that the application of the remedy in treatment of tetanus is based. Involuntary muscle is also profoundly affected by the action of the drug, contraction of uterine and bladder muscles being stimulated as well as peristalsis of the muscles of the gastro-intestinal tract. Eserin has frequently produced abortion in pregnant animals and this possibility should be kept in mind when administering the drug, and the client informed accordingly.

Toxic Symptoms

Among the prominent toxic symptoms are pronounced muscle tremor, muscular relaxation, weakness, causing the animal to fall or lie down. Salivation is marked, the pupil is contracted, loud peristaltic rumbling can be heard, there is profuse bowel discharge, mixed with flatus and mucus, vomiting takes place in those animals capable of the act. The pulse becomes rapid and weak, and there is loud sterterous breathing. Death takes place from asphyxia.

Treatment of poisoning with eserin consists in emptying the stomach if the drug has been taken orally—and the administration of the physiological antidote—which is atropin. Other diffusible circulatory and respiratory stimulants may be used such as alcohol, ammonia, camphor, digitalis and others. In severe cases artificial respiration may be used.

Therapeutic Uses

In the form of a one per cent solution eserin is used in treating various conditions of the eye where contrac-

tion of the pupil is desired. Thus in management of glaucoma the drug is useful to reduce the intra-ocular tension and contract the pupil. It is also beneficial in conjunctivitis to contract the pupil and relieve the photophobia. In ulcer of the cornea eserin solutions are used in alternation with atropine to prevent the development of synechiae. Where it is desired to quickly overcome the action of atropin on the pupil eserin is used. It requires a larger amount of eserin solution, however, than the amount of atropin solution previously instilled if the effects are to be overcome completely, as the drug is less powerful in its action than atropin.

An empirical use for eserin consists in the injection of a solution containing one to two grains into dropsical joints or bursae. Some good reports have been made following this use of the drug.

Use As a Cathartic

As a rapidly acting cathartic eserin is one of the most prominent in the veterinary armamentarium. In obstinate constipation of mild degrees of impaction it is a powerful agent and given in combination with pilocarpin and strychnin the results are prompt and decisive. Large quantities of fecal material are passed, as well as a large amount of flatus. In twist of the pelvic flexure of the colon the hypodermic administration of eserin is the best possible treatment. As to the use of the drug in flatulent colic there is some difference of opinion. In my judgment there are other better and safer measures.

In cows suffering from acute gastritis or impaction of the rumen or omasum eserin and pilocarpin singly or combined are exceedingly effective. Eserin in dose of grain, one-twelfth to one-sixth may be given to foals or calves where there is retention of the meconium. Chronic constipation in dogs is also benefited by administration of this drug in suitable dosage.

Physostigma is frequently added to cathartic pills for the purpose of increasing their efficiency. Small repeated doses of the drug given in this manner are effective in toning up the mucous membrane and muscular coat of the bowel and correcting the condition.

Eserin has been employed in both veterinary and human medicine for purpose of combating tetanus. Results, however, have not been such as to commend the extensive use of the agent for this purpose. The rationale of the eserin treatment of the condition lies in the power of the drug to relax muscular tissue and thus overcome the rigidity and spasm characteristic of tetanus. Parturient paresis is improved and the favorable outcome hastened by the administration of eserin in suitable dosage to unload the bowels. This in addition to the use of air to inflate the udder. In the treatment of choke some men report favorable results from the use of eserin.

I wish to state that the AMERICAN JOURNAL OF VETERINARY MEDICINE is appreciated by me very much. As I look forward to the first of the month to come, I wish it would come four times monthly. E. WYATT.

Gorman, Texas.

The JOURNAL is the best and most instructive veterinary publication I ever read. I for one would not be without it. H. A. ROMINE.

Fitzgerald, Ga.

I appreciate your interesting and excellent JOURNAL. It will keep to the front the practitioner who is a regular reader of it. It carries the advancement with it. D. F. ROSS.

Reeds Spring, Mo.

The AMERICAN JOURNAL OF VETERINARY MEDICINE is a great journal and no veterinarian should be without it, as it is the "best ever." A. L. TIFFANY.

Monroe, Mich.

Therapeutic Digest

By MART R. STEFFEN, Brillion, Wisc.

Hemadenology

When you read this you read the "last word" in medical science. By this term, hemadenology, is to be designated the specialty of the study and therapeutics of the ductless glands.

According to a recent issue of the New York *Medical Journal*, hemadenology is already a specialty, and a separate department has been added to that journal for the handling of this subject under the direction of the greatest living authority on the ductless glands, Dr. Charles E. DeM. Sajous of Philadelphia. The first installment of articles on the subject appeared a few weeks ago and outlines the nature of the specialty and its object.

The term hemadenology is, literally, the study of, or a discourse on the blood-glands. The aptness of the term has already been challenged and some space is devoted in the first article to a defense of the appropriateness thereof.

In introducing his subject Dr. Sajous says in part: "Many believe that the addition of several organs, the ductless glands, to those such as the heart, lungs, liver, etc., which have been studied for centuries, will necessarily transform present conceptions of disease and therapeutics. Be this as it may, the fact remains that these organs and their products, the internal secretions, have assumed so prominent a role in medicine, and a knowledge of their influence on morbid processes has become so necessary to professional success, that it was deemed advantageous to the readers of the New York *Medical Journal* to publish a series of articles presenting those features of the subject most likely to furnish material aid in practice."

In these articles Dr. Sajous promises to furnish and add to diagnostic and therapeutic aids, because "the functions of each organ will be as closely analyzed as prevailing knowledge will permit in order to account for the morbid signs witnessed and the manner in which the glandular agents produce their beneficial effects." A review of these articles will be maintained in these columns and sections of value to veterinary practitioners will be dissected in detail.

Veterinarians, any more than physicians, cannot afford to slight any subject which makes for better practitioners, and while often it is not easy from a practical standpoint to smoothly combine theory and practice, the day of rough and ready practice is on the wane. As Dr. Sajous says, "In the light of modern thought empiricism is unthinkable."

While on the subject of the ductless glands and their products, I would remark on pituitary extract, probably the most recently exploited of these agents.

Until recently used only for its action on the uterus in parturition, it is now

variously recommended for intestinal stasis. In recent issues of a number of medical journals can be found articles on this subject.

One author makes the claim that the action of pituitary extract can be controlled by means of an irritant placed in a natural opening. For example, if he desires the effect of the extract to be that of an evacuant he inserts a gauze strip into the rectum after injecting the extract hypodermically. If he desires its action to be exerted on the bladder he inserts the gauze in the urethra. He states that unless the action of the pituitary extract is focused on some particular organ by means of some irritant, a piece of gauze for instance, the action may be very disappointing, frequently nothing more than a rise in blood pressure.

The use of pituitary extract is far from being understood and of all glandular therapeutic agents it is most uncertain in effect.

Possibly the investigations of Dr. Sajous will bring a better understanding of this product and it may yet be made practically useful.

Dr. F. Proescher, in an article on a contribution to the Etiology of Foot and Mouth disease, makes the statement that "the filterability of the microörganisms of these diseases led to the erroneous impression that they were microscopically invisible, or in other words, that their size was less than 0.1 micron, below the intransgressible limit of the microscopic visibility."

He is of the opinion that fault in isolating various filterable viruses, including that of foot and mouth disease, lay in improper staining. He has succeeded in demonstrating, by special staining methods, exceptionally microscopically-minute organisms in two cases of foot and mouth disease. They are in the form of "diplococci or diplobacilli, sometimes appearing in short chains, closely packed together."

On account of lack of material he has been unable to further pursue his investigations.

A CASE OF MYXOID DEGENERATION OF THE FRONTAL BONES

Not many cases of myxoid degeneration of the bones of the skull in horses are on record. Apparently it is a very rare pathological condition. Cases which have been reported were mostly in young horses and sucking colts; now and then the condition has been known to occur in mature animals.

The case which I am about to record is that of a grey gelding about seven or eight years old. He is a fair specimen of the express type and in good condition, weighing about 1,250 pounds. He was raised by the man who owns him now and was supposed to be a "whistler" or "roarer" since his colthood.

This roaring was not typical and, until the evidence of the myxoid degeneration developed, it could not be satisfactorily diagnosed. Now that the true condition has shown itself the roaring, according to other records of such cases, is explained.

On looking up these cases I found that in nearly every instance the horse was either affected with roaring, snoring or had some other form of respiratory impediment which was puzzling and which could not be satisfactorily diagnosed until the appearance of signs of the myxoid degeneration.

The case in this grey gelding was brought to us for treatment because of a "bunch" on his forehead.

According to the owner's statement it had been forming for several months, being about the size of a hazel nut when first noticed. It has now attained the size of a large hen egg and had about the form of an egg, the apex pointing straight outward, like a horn.

No abrasion could be seen; the skin over it was perfect.

The location of the "bunch" was exactly over the frontal sinus, a little to the left of the median line. To the examining finger it felt very tense, almost hard, and pressure with the finger over it evidently caused considerable pain, evidenced by jerking the head and attempts at rearing up. A cyst was diagnosed; no details as to the nature of the cyst were gone into.

With a twitch on the nose an exploring trocar was inserted. Instead of pus (which was really what we expected to find), there came a flow of rusty-colored liquid which spurted outward to a distance of six or eight feet.

As the contents flowed out the apex of the "bunch" caved in and it could now be plainly felt with the examining fingers that the frontal bone at the base of the bunch had disappeared or become absorbed. The skin could be pushed into the sinus like an inverted glove finger.

The diameter of the hole in the frontal bone was irregular, varying from one inch at the narrow point to more than two inches at the widest. The edges were very smooth and seemed to have a thickened margin.

When most of the fluid had been drawn off the area was painted with iodin and the horse sent home, with instructions to bring him in again in three or four days. This gave us time to look up the handling of the condition.

When the horse was brought in again the "bunch" was just as big as it had been before we tapped it and the owner stated that it had filled up a few hours after he took him home.

As we had "brushed up" on the condition and its treatment by this time we recommended incision of the bunch, through curettement of the sinus and of the edges of the frontal bone. This was refused.

We then prescribed painting the bunch and a considerable area around it with iodin, and iodid of potassium internally.

After two weeks of this treatment the bunch has gone down considerably, but an interesting change has occurred. There is now a discharge from both nostrils of a fluid the same color and consistency as that removed with the trocar. Evidently the process has progressed and the sinus is now draining itself.

The gelding shows no ill effects in any other manner and works every day. The owner has now consented to submit him for operation at a later date. If he keeps his promise we will report results.

MART. R. STEFFEN.

Brillion, Wis.

METHODS OF IMMUNIZATION

(*Continued from page* 242)

when we are gone, and still ready to seize every opportunity to make further advances and to commit further devastations.

This does not differ essentially from the method used in No. 5. Both are liable to transfer the virulent germ to a susceptible animal and, therefore, to spread the infection, and even if partially guarded by filtering or using the centrifuge, this but diminishes, and does not effectually exclude, the living and infective microbe which remains in the field a possible means of propagating the plague.

SPARE TIME DISSECTION FOR THE PRACTITIONER

(*Continued from page* 253)

have a good chance. In your town there is no doubt some young fellow or a physician or the school teacher (or possibly your wife), who would be glad to read M'Fadyean to and for you, and both of you become deeply interested.

Should anyone try out the above suggestions I should be pleased to learn his results and opinions.

Queries and Answers

The editor will reply to queries appearing here, as he is able and as opportunity permits, but he does not want, nor cannot undertake to monopolize this portion of the department. Any reader who can furnish further and better information in reply to any query is urgently requested to do so. Where the treatments advised in these replies is adopted it is hoped that those employing them will report their results whether good or bad. In all cases give the number of the query when writing anything concerning it.

Query No. 135.—Will someone kindly give a report of a case of impaction of the cecum of the horse with symptoms and post mortem appearances?

Query No. 136.—What is the most desirable way to remove a capped hock from a very valuable stallion?

ANSWER TO QUERY No. 61. Abbott's Sulphocarbolates have been successful in my hands.

ANSWER TO QUERY No. 68. Digital neurotomy.

ANSWER TO QUERY No. 69. Abbott's Emphysema Compound have helped all cases and cured a large percentage in my practice.

ANSWER TO QUERY No. 36. Mix some cannabis indica with a little water (or blood) and note results. None of it for me.

ANSWER TO QUERY No. 51. Yes.

J. D. P., Colorado.

ANSWER TO QUERY No. 71. There probably was, but why not be more thorough in your examinations and find out?

ANSWER TO QUERY No. 84. Give a mixed bacterin containing streptococcic, staphlococcic and colon bacillus. Inject tincture of iodin into the umbilicus, first time enough to reach the bladder, which would be about a dram, and in after treatments, only enough is used to reach an inch or an inch and one-half into umbilicus. Use iodin once or twice daily and tamp the umbilicus with tannic acid. Use tannic acid more often if necessary to stop the leaking. If joints are swollen, bathe with white liniment and iodin.

ANSWER TO QUERY No. 85. Union generally takes place, but the horse does not stand as straight as before. It does not interfere with the horse's usefulness for work on the farm.

ANSWER TO QUERY No. 87. Yes.

ANSWER TO QUERY No. 95.—I have used a saline solution in the treatment of "sweeney" with most gratifying results. For me one injection does the work, even in the worst cases. I have used it on numerous cases, as have several of my friends, without any complications and without a single failure. In fact, no other line of treatment has produced such results in treating this condition, and complete recovery takes place in an astonishingly short space of time. I use one ounce of sodium chloride to a quart of water which has previously been boiled and allowed to cool to a temperature of about 104° F.

The affected shoulder is washed with a 2% or 3% creolin solution and a sterile hypodermic syringe—I use one of 30 cc. capacity—is then filled with the saline solution. The injection is made subcutaneously at the highest point of the affected area. The amount of solution necessary depends entirely upon the amount of tissue which has wasted away. If more than one syringeful is necessary, do not withdraw needle but simply detach from syringe, refill syringe and inject as before. Each time after emptying syringe, the shoulder should be massaged so as to force the solution down over the entire area. After a sufficient amount of solution has been injected,

which must be determined by the operator, the needle is withdrawn and, in most cases, nothing more will be necessary.

Occasionally, however, we find cases in which an immense amount of tissue has atrophied, cases which have persistently refused to respond to counter-irritants externally applied, faith cures, laying on of hands and mumbling of words.

In cases such as this, the saline solution proves its worth. In such I have injected as much as a quart of saline solution of the strength above referred to, and after a lapse of three or four days (in these severe cases) I make an incision at the lowest point over the affected area so as to drain off the solution, which will resemble the thin watery discharge frequently found in an abscess. A rubber nozzle is inserted in this incision and the affected area irrigated once or twice a day for a few days with a 2% creolin solution.

This treatment may be condemned by many good practitioners—why, I have never been able to learn. In my hands, it produces positive results, which I and my clients desire, so, to use a slang phrase, "why should I worry?" F. C. R.

ANSWER TO QUERY No. 112.—The formula and directions for compounding R. C. Moore's spavin paste are as follows: Spavin ointment—Take mercury (quicksilver) 2 ounces av., nitric acid, oil of cedar, tincture of cantharides, each 2 fluid ounces. Mix these in a 2-gallon earthen jar, which should be previously warmed to at least 70 degrees F. Stir the ingredients until they begin to effervesce, then cover the jar with a heavy cloth and allow effervescence to be completed. When the ingredients have cooled, apply as follows:

Clip the hair from over the enlarged bony tumor, whether it be spavin, splint, ringbone or sidebones, and rub the ointment into the skin thoroughly three times a day for two or three days. If at the end of the second day there is a marked swelling of the surrounding parts, showing that the medicine has irritated the skin pretty thoroughly, then discontinue its use. At the end of 24 hours, dissolve all the exudate with alcohol and treat the wound with white lotion until it has healed. The animal so treated should have from four to six weeks rest after treatment.—C. C. H., Enid, Okla.

THE TREATMENT OF WOUNDS

(*Continued from page* 262)

upon alone by many and if the immersion is a long one may be regarded an appropriate and safe expedient for the particular purpose of assuring the best sterilization possible without injuring the keen edges of sharp knives.

Rubber goods (gloves, catheters, drainage, tubes, syringes), will stand a certain amount of boiling without injury, and as these are not usually very costly the injury they do sustain is unimportant. Costly instruments of this class can also be made safe by immersing them for some time in strong solutions of mercuric chloride.

The re-soiling of instruments during operations must be prevented by simply preventing them from coming into contact with soiled objects and when they become infected by contact with pus or other infected materials they should be set aside and not placed upon or near clean instruments on the tray. The use of a little caution and plenty of common sense is needed in handling instruments, otherwise the whole plan of clean operating will be futile.

(To be continued.)

Enclosed find check for $2.00, for which please continue my subscription one year to AMERICAN JOURNAL OF VETERINARY MEDICINE. It seems that I cannot afford to be without this valuable journal. Wishing you success during the year 1915.

E. F. ALLMAN, D. V. S.
Lost Creek, W. Va.

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the thanks of the editor, the approval of the veterinary profession and the lasting gratitude of those who are aided by your suggestions.

FOOT AND MOUTH DISEASE IN SOUTHERN KANSAS.

As no foot-and-mouth disease was reported west of the Mississippi river in the recent outbreak in the central states, Kansas had hopes of being spared from the plague; but our hopes were shattered January 30 when the diagnosis of foot-and-mouth disease was confirmed by the state and federal authorities.

On account of the building of a milk condensary at Winfield, two farmers already having a small herd of Holstein cattle were very anxious to increase their herds, so they went into a "clean" district in Wisconsin, bought their cows, shipped them in a palace car and never unloaded them until they arrived at home. The owners think they must have carried the virus on their shoes from walking around in the Chicago Yards, but they were told they were not within a quarter of a mile of the quarantine lines. Nevertheless they brought the foot-and-mouth disease into Southern Kansas and now four counties are under special quarantine, Cowley, Sumner, Sedgwick and Butler.

Stamping out an outbreak of foot-and-mouth disease is quite a complicated problem, and requires a careful systematic co-operation of the whole community to get results. We local veterinarians, the sheriff and all his force were drafted into the work and you may be assured we were a busy lot of men. The sheriff said he answered the phone until he was black in the face, as his office was used for our headquarters. We veterinarians were kept busy quarantining exposed farms and watching for signs of the disease on the exposed farms. We were covered up with calls from the

Killing Pure-bred Cows that had Apparently About Recovered from Foot and Mouth Disease.

farmers wishing to ship their cattle and hogs to market, as they were allowed to ship them to market for immediate slaughter only after an inspection by an authorized veterinary inspector.

The infected cattle and hogs are now all under the ground, the exposed farms are all under a strict quarantine, and the Federal men are now disinfecting the infected and exposed premises. If there are no new cases within the next

few days we will feel sure the disease is under control, but I fear this disease, like hog cholera, when once introduced into a country is liable to break out again at any time.

I was present at the slaughter of the herd twelve miles southeast of Winfield on February 13. After a Federal Inspector, a representative of the State Live Stock Commissioner, and one of our county commissioners appraised the herd, we proceeded to put them under the ground and cover up with quick lime.

The Doctors and the Undertakers, the Judges and the Executioners. The Third from the Left is Doctor Winsett.

I assure you it was a pitiful task to lead those fine pure bred cows into the trench and shoot them down, as several of them had apparently recovered from the disease and were eating and drinking normally.

The foot-and-mouth disease has assumed a grave situation in America and I think every veterinarian should make a close study of it, as he knows not when he is going to be called upon for a decision, which if given quickly and correctly will save his state thousands of dollars. In our outbreak a correct diagnosis was not made until five days had passed after the symptoms first appeared, but fortune seems to have favored us as there are no new cases up to the present time, and the country was badly exposed.

I will try and enumerate some of the symptoms as I have observed them during our work here. The symptoms noticed are dullness, shivering, staring coat and loss of appetite. In the milk cow the flow of milk suddenly ceases. You will next notice a grinding of the teeth and a smacking of the lips, the smacking of the lips is accompanied by a profuse salivation, and if standing in the wind the strings of saliva will sail off into the air like a spider webb.

The feces at first are passed off in hard pellets, and in about three days a profuse diarrhea follows. You will notice vesicles on the incisor pad, end and sides of tongue, and also on the teats of milch cows. After a short time these vesicles rupture and leave an angry looking sore. In most of the cases the lesions of the mouth precede those of the feet. In an animal with white hair above the hoof you will notice a pinkish hue around the coronet and it is very painful to the touch. The symptoms, all but the sores in the mouth, seem to subside in about a week and they begin to look normal with the exception of the loss of flesh.

Foot-and-mouth disease can very easily be confused with mycotic stomatitis, but on seeing any of these symptoms any veterinarian is justified in quarantining the farm, thoroughly fumigating himself with the fumes produced by potassium permanganate and formalin when put together. The proportions used are half ounce of potassium permanganate to an ounce of formalin. Then call upon the state authorities for help in making a correct diagnosis, as it is better to be safe than sorry.

I. G. Wimsett, D. V. M.

Winfield, Kan.

NAVEL ILL

After some years of investigation and a great deal of thought on the subject of navel ill, it was interesting to read the article which appeared in the last issue of the AMERICAN JOURNAL OF VETERINARY MEDICINE, wherein the statement was made that fifty per cent of all cases of navel ill were contracted *intra utero*.

This statement seems somewhat extreme since it does not conform with the experience of our best authors who state frankly in their text books that the germ causing navel ill is contracted at the time of or soon after birth, before the navel dries, which seems likewise to be the opinion of most practitioners.

Reports of cases of navel ill, where the colts were foaled in pastures in which there were no sheds or feed racks are comparatively few, and usually upon a thorough investigation it was found that infected colts were dropped on ground where the stock would congregate on account of annoyance from flies, thus developing a contamination equal to that of barn or lot.

The accompanying picture is of a percheron colt, eligible for registration, with navel ill, the property of L. P. Kessler, Iowa City, Iowa, foaled in a pasture where there was not even a feed trough. Investigation revealed that at the time of foaling the colt scrambled into a drain from the barn and lots.

A Familiar Barnyard Scene.

Reports are not published of mares which yearly foal a colt that has navel ill. Records of hundreds of colts can be had where colts die of navel ill which were foaled in filthy places and after the owners were taught sanitation and their place thoroughly cleaned no more colts were lost from navel ill.

Quoting W. L. Williams, "Oppor-

tunities for infection at time of birth are not wanting. Even before the fetus has escaped from the vulva, or the cord ruptured, any infection existing in the vulvo-vaginal canal of the mother may have acquired a habitat on or in the cord.

"Purulent infection of the navel is greatly favored by many of the circumstances attending the birth of the young animal. When it is born in a stable or barnyard, or in surroundings where filth and dirt are abundant and omnipresent, there is constant exposure to infection of the new made wound. Whenever the animal lies down, especially in sternal recumbency, the new made wound comes in direct contact with infected bedding, decomposing feces or urine, or with filth which may chance to exist at such a point." Purulent infection of the navel very frequently arises also as an indirect result of ligating the umbilical cord. The danger from ligating the cord consists usually of two principal elements: First, infection of the wound by careless ligation including the providing of a breeding ground for bacteria by the inclusion of Whartonian gelatin; second, infection from infected hands and also dirty, infected ligature. Infection of the navel cord by flies should not be lost sight of, as this source of infection is thought by many to be the key to why infection of the navel of the new born occurs when colts are foaled in pasture.

Typical Case of Navel Ill.

The picture herewith shows a barn where mares are permitted to foal. The owner thinks the barn clean when the manure is thrown out and clean straw placed for bedding, but does not take into consideration the hot bed of infection at the end of the barn which serves as an incubator for flies, pests that are usually disease carriers.

It is thought possible that navel ill, purulent infectious type, might be transmitted *intra utero*, but this is not very probable. Granting this to be the mode of transmission of infection to the fetus, it would be difficult to explain how navel ill, pervius urachus type, could be contracted.

Calves are not as susceptible to the germs that cause navel ill as colts, and have more resisting power. Some cases are reported from different sections of the country.

Pigs are prone to navel ill and seem to be more susceptible than calves, but not so susceptible as colts.

S. L. STEWART, D. V. S.
Kansas City, Mo.

"EPIDEMIC OF ANIMAL DISEASES NEEDLESS"

UNDER this striking headline Mr. S. J. Thornton, president of the Missouri Cattle and Hog Ranch Company, in the *Twentieth Century Farmer* discusses this important problem and offers suggestions, some good and some not, as to how epizootics may be prevented. Some of the suggestions are as follows:

Under the sub-heading "Why Not Use Sense?" he says: "Today when a boy or girl gets a sore throat we do not wait until diphtheria develops and spreads all over the community. No, mother has in the closet a bottle of some simple and effective antiseptic and Johnny or Mary takes it, and does so in time, etc." "There is scarcely a human ailment that cannot be cured if taken in time."

Comments upon this are hardly necessary but it is the effect of such erroneous "advice" as this from those who lack a knowledge of the rudiments of transmissible diseases, either human or animal, that has seriously hampered the strenuous efforts of thoroughly trained veterinarians, both federal and state, to control foot and mouth disease.

The inference from such statements is that by having a bottle of "simple and effective antiseptic" in a box in the stable with the curry combs and brushes, and giving some to an ailing animal serious transmissible diseases can be prevented.

The country papers in regions infected with foot-and-mouth diseases have been filled with similar articles telling how easily they have cured foot-and-mouth disease, both in this country and Europe, with such "simple and effective antiseptics" as vinegar and salt. Every such article raises a question in the mind of the stockman as to the necessity of stringent quarantine and vigorous wiping-out of centers of infection as carried out by veterinary authorities who have the interest of the livestock industry at heart and who are endeavoring in spite of such opposition to save the stockman from one of the greatest economic calamities that can befall him and the country.

Later in the same article under the heading "Veterinarians Should Qualify" he says: "Of course, they'll get mad about it. I reckon the barbers held many 'conventions' and 'gabfests' when the king told them they would have to go to the school he had started, to study in. The truth of the matter is that about half of the veterinarians today are absolutely incompetent to handle veterinary matters in a modern scientific manner and insure cattle and hog health just as the ordinary 'doc' of twenty years ago knew almost nothing about real medical treatment for humans. The law stepped in and made the human physician competent and the law must do the same for the 'vet'."

In spite of the error and exaggeration in this paragraph there is some truth mixed with it. In the first place, the veterinary profession are not going to

"get mad about it." There are many ignorant practitioners in the veterinary profession, but the graduate veterinarians of the United States will compare favorably with any other profession. If Mr. Thornton had informed himself before writing the article he would have found that the veterinary profession originated, and has succeeded in getting enacted into laws, measures that would protect the stockmen from ignorant practitioners, whether graduates or not. In every case that the writer knows about the strongest opposition to such laws has come from farmers and stockmen.

Mr. Thornton should know that the *veterinary profession* has raised the entrance requirements to the veterinary colleges, lengthened the course of study, required a proper corps of teachers, and the American Veterinary Medical Association has a committee that visits the colleges to see that the requirements are carried out. At the present time the veterinary profession as represented by this association is trying to get all of the veterinary colleges of this country on a four-year basis.

The veterinary profession has provided a state board of veterinary examiners in nearly all states to examine graduates to determine if they are competent before allowing them to practice. The ignorant practitioners complained of were allowed to continue to practice because the legislatures would not pass a law that did not recognize and protect the untrained non-graduates. Mr. Thornton does not seem to be aware of the fact that among the great livestock producing countries of the world there is none so free from great animal plagues as the United States and there is no country in the world that has a more efficient bureau of animal industry for the protection of the livestock than has this country. When the present outbreak of foot-and-mouth disease is stamped out, as it will be, and as it would have been before now if the veterinary profession had received the support they should have received, the intelligent stockmen will rise up and call the veterinary profession blessed.

What the veterinary profession needs is the active sympathetic support of the farmers and stockmen of the country in all measures that will give better trained veterinarians, better laws to prevent the scattering of transmissible diseases, and also in enforcing the present laws.

N. S. Mayo.

Chicago, Ill.

ONE TWIN INCLOSED WITHIN THE OTHER

I was called to see a heifer in her first labor last July; another veterinarian had been called to attend this case, and after nearly two hours' work had given up, and reported to the owner that he was unable to straighten the calf, and recommended killing the heifer, as it was one of the few cases where delivery is impossible. This was not satisfactory to the farmer and his near neighbor, and I was called.

I found heifer down, straining violently and almost constantly. The calf was forced well into the pelvis and its head turned back; both front legs doubled under its body. My comment (to myself) was this will be easy enough, providing the arch will admit passage. Lucky for me, I said nothing to the owner or neighbor about how easy I would deliver this calf in about ten minutes.

I asked for a couple of small ropes, one to tie to the head, the other for the legs; this was soon completed. The head was raised first and then the legs were straightened out; everything seemed all right, and I pulled, and pulled hard, then called for the owner to help, and very soon for the neighbor also. We were unable to bring the head and legs past the arch at the same time. I then repelled the calf, and replaced the legs in the bottom of the uterus, and tried the head alone. After several pulls, the head came through the arch, and by traction far enough out of velva to take it off. This done,

I secured a fold of skin of the neck with a rope, and repelled the calf again, picked up the legs and again pulled. This time we succeeded very well, until the shoulders and sternum were both exposed at this point, and again we were done. Being unable to explore the body on account of the smallness of the animal, I opened up the calf through the sternum and removed heart and lungs. Then cut the diaphragm, removed liver, intestines and stomach. You will realize that the opening in such a condition is very small for the hand to pass inside the fetus, lying in the vaginal canal. After removing, as stated, what I considered all of the internal organs, we again pulled—the three of us. About eight inches were gained, and the fetus would come no further. Then a larger opening was made and another examination. This time I had removed all the ribs of the fetus; this left my hand pass into the abdomen much easier. I found there something that felt as large as a good-sized watermelon, solid in consistency, just about the shape of a kidney and covered with a dense capsule. This I broke open and with my fingers broke some of this solid mass off, and by looking at it, it resembled fat. This fat-like substance broke up in squares about one inch, or in other words, it was lobulated. I removed what I thought was about half of this bunch, and then got the calf, pulling alone. On further examination the kidneys were normal; the liver and intestines, apparently so. From the center of the concave side of the fleshy mass that the abdomen contained a small like cord, resembling a vein passed to the umbilicus of the fetus. What was it? Fat? I should judge it weighed at least twenty pounds.

D. O. KNISELY.

Topeka, Kansas.

COMMENT: The fleshy mass that Dr. Knisely found may have been an undeveloped twin that had become inclosed within the body of its mate during the development of the latter. Williams says: "This presumably results from fission of an ovum by which two embryos result from a single egg, and, being unequal in size and remaining intimately connected, the one grows around and includes the other, until finally its inclusion is more or less complete."

22981. King, the five-year-old lion of the Wallace-Hagenback circus, now engaged with other performing animals at the New York Hippodrome, being prepared for an operation for abcess.

A PRACTITIONER'S VIEW OF VETERINARY ENTRANCE REQUIREMENTS

A man's standing in any community is easily judged by the company he keeps. If he maintains a place for himself in the business and social life of his town or city, he is (you can safely bet) meeting with considerable success in his profession, no matter what it is.

We, as veterinarians, have a hard row to hoe, not only in a business, but a social way, and we are just beginning to better these conditions for ourselves, which have existed for so long, by showing that we are deserving of recognition for ourselves and our profession.

Some of the uneducated men who preceded us in our work and whom we are pleased to call "quacks" are pretty fine men, highly respected in their communities and have had no college training sim-

ply because when they took up the work there were no veterinary colleges; but even so, I know a few who are much better men, better veterinarians and much better off in a business and social way than some recent graduates of private veterinary colleges. I had occasion not so long ago to write to a private school graduate, and his reply was enough to make me blush with shame for the profession, for he addressed the envelope "Mr. Doc. R. A. Dean, Veterinary," and the letter itself was misspelled and very poorly written. He was a "boozer" and commanded very little respect in his home town. We all know there are plenty more just like him, and it seems to me that this state of affairs is what we are trying to improve. It stands to reason that if he had had a high school training, if we were all compelled to have, we couldn't disgrace ourselves and our profession in such a manner. Yet, we have men at the head of our private colleges who write in favor of "The Sturdy Farm Boy as a Veterinary Matriculant." I also want to say that the graduate I refer to was a "Sturdy Farm Boy."

It is no wonder to me that the authorities are trying to take the practitioner's work away from him and have the government appoint men to do it whom they know they can rely on. They are trying to take away our privilege of examining stallions, of inspecting stock for shipment, of vaccinating hogs, and they never would let us inspect for Canadian shipment. Apropos of all this "uplift howl," I can't understand how we can consistently expect the laity to respect us when we don't respect one another and don't place much confidence in one another's work.

I want to go on record right here of saying that just so long as we let our private colleges take in every "sturdy" boy or man that has the price, as they have done and are doing, just so long will these conditions prevail, and we shall be forced to blush with shame for our profession on account of some of the graduates.

I believe every matriculant at any veterinary college should first prove that he is a high school graduate and that when he is graduated and has taken and passed a State board examination, he should be respected and trusted to do anything and everything pertaining to his profession until he should prove himself unworthy. When that happy time comes, which I hope with all my heart will be soon, we will come into our own as a profession really deserving of recognition.

R. A. DEAN.

St. Peter, Minn.

CONTRACTED TENDONS IN FOALS

A very common ailment of the newborn is what I have been pleased to call congenital contraction of the flexor perforatus and perforans tendons of the front leg, very rarely of the hind leg. Some assign this condition to undue length of the extensors, but I have found in my cases that it was invariably due to contraction of the flexors; for even under anesthesia, I have been unable to bring many of them to their normal position. As regards anesthetics, if I can bring the parts near a normal position without, I do not use them, but when this is impossible, I always resort to anesthesia and find it a great help.

The material needed to correct this condition consists of plenty of cotton, strips of tin about three by twelve inches, a pair of tinners' snips, plenty of roller bandages, and a liberal supply of plaster of paris. Cast the colt; extend the leg to as near a normal position as possible (give chloroform if needed); wrap the leg well in cotton, and run a roller bandage over this to keep in place. Now fit the tin splints on both the anterior and posterior aspects of the leg, notching out the sides with the snips so they will conform to the contour of the leg and joint, the posterior splint coming well down to the heel but not touching it, and the anterior extending down the front of the hoof to the ground. Now apply your plaster of paris ban-

dages freely, with the leg under traction to keep it straight. Keep the colt in a recumbent position until the plaster is well set; then let him up. The plaster bandages should be applied as tightly as they can be drawn as there is no danger of strangulation if plenty of cotton has been used. The tin splints also make an even pressure and so prevent cording. Since using the tin splints well fitted, I have had fine success.

The length of time the cast should be worn varies from two to three weeks according to the severity of the case. The dressings should be applied within 24 to 36 hours after birth to insure the best results, by all means before sores have formed by contact of the pasterns with the ground. One or both legs may be affected. Last season, I had two mule colts from the same jack, affected in both front legs. Under the treatment outlined above, both cases made fine recoveries.

JOHN L. TYLER, M. D., D. V.S.
Pomona, Calif.

OH, WHERE IS THE CANNERY?

In the March issue of the JOURNAL I commented on an article by Dr. Chas. H. Duncan which appeared in a recent issue of the *New York Medical Journal.* In this article Dr. Duncan attempts to substantiate certain personal opinions by digging up the long forgotten, disproved and decayed theory of telegony.

As editor of the "Therapeutic Digest" department in the JOURNAL I commented on Dr. Duncan's article because he touched on the breeding of live stock in his discussion. I also wrote to the editor of the *Medical Times,* who apparently was caught napping also, as he commented favorably on Dr. Duncan's article, suggesting that in the future articles of a semi-veterinary nature be submitted to a veterinary censor before publication in his journal.

The fact that the editors of these two popular medical journals allowed such "hundred-year-old" stuff to get by is, even yet, excusable. They merely touched on ground a little out of their line. But now comes "the blow that killed father!" The *American Veterinary Review,* in its March number promises its readers among other April treats, (?) Dr. Duncan's article. Here words fail me! I can only think of Osler's procedure. Remember, *telegony has been found, absolutely, to be without a shadow of foundation;* and that many years ago. It has not been theorized into the ground, but by actual demonstration Cossar Ewart gave it a knockout blow.

Many veterinarians have had their troubles in ridding the minds of breeders of this bugaboo. If you have ever practiced in a breeding district where this old theory still "stuck in their crops" it gave you many an argument.

And now, when the subject is just nicely buried, the *American Veterinary Review* would insult the intelligence of its readers with a re-hash of it *by a physician.* I am boiling over.

Brillion, Wis. M. R. STEFFEN.

THE GLAD HAND FOR DOCTOR ROGERS

I note Dr. Rogers article in your JOURNAL for March about The Sturdy Farm Boy vs. the High School Kid as a Veterinary Matriculant. Dr. Rogers is my kind of a *man,* and I will see that gentleman one of these days.

JOS. J. SMITH, D. V. S.
Beaverton, Oregon.

RESTRAINT DURING OBSTETRICAL OPERATIONS

I have had little trouble in the control or restraint of animals during obstetrical operations. The easiest restraint to apply is chloroform, and the danger in the puerperal state is at a minimum, parturient animals seeming to tolerate chloroform in large amounts and long continued. If you have no one competent to give it for you, smear a little vaseline in one or both nostrils and saturate a small sponge with chloroform and insert same. This is very satisfactory when no other means is at hand.

As regards the use of anesthetics in general in the young and also in the parturient state, I will say that they seem to be largely immune to the dangers experienced at other ages and in other conditions. Also, when I refer to an anesthetic, unless it be a local one, I mean chloroform, as I consider it the safest and best.

JOHN L. TYLER, M. D., D. V. S.
Pomona, Cal.

SEPTIC METRITIS FOLLOWED BY PYEMIC ARTHRITIS

On November 18, 1914, I was called to see a black mare, eight years old. I found her suffering from impaction of the bowels. I gave her the regular line of treatment and she recovered nicely, but in a few days she became lame in the left hind leg, and upon careful examination, I was unable to discover the cause of the lameness. However, I was inclined to think it was in the stifle as I thought I could detect a little heat in the joint and I, therefore, applied a mild blister. In a few days the leg appeared better but the mare was lame in one front leg. Then, the lameness would shift around from leg to leg, appearing better at times only to become worse afterwards. About this time, a small edematus swelling appeared upon the breast just back of the front legs. Not knowing what the trouble was, I called it rheumatism and gave treatment for the same without benefit.

At this time I asked for counsel and Dr. J. H. Blattenberg of Lima was called in consultation. Doctor Blattenberg discovered that the vagina was occluded and advised an operation. Let me state here that the mare had had a difficult delivery that same spring and was lacerated considerably at that time. Upon opening the occlusion in the vagina, we found a large quantity of pus in the uterus.

Treatment: Daily uterine irrigation, poly-bacterins, blood tonics, etc., and after several weeks of treatment, the mare died.

Necropsy findings: Septic arthitis in several joints, small pus foci in the mesentary and vegetations on the valves of the heart with long clots attached.

CHAUNCY E. COOK, D. V. M.
Ada, Ohio.

WHY NOT BE SENSIBLE?

Would it not be a good thing for all concerned to have veterinary or agricultural colleges give a short practical course of training to non-graduate registered veterinary practitioners? A great many states have laws which permit persons who have been in active practice for a certain number of years to register and continue to practice although they are not graduates of any school. Graduate veterinarians in high positions were influential in framing and passing these laws and must have recognized the justice or necessity of giving those men a legal right to practice. Since they have this right, should they not be taught to practice intelligently and humanely to the great advantage of their clients and patients?

There may be many registered quacks. However, the non-graduate who does not pretend to be that which he is not, but strives to give those who employ him the best possible service of which he is capable, is not a quack. All such would gladly avail themselves of an opportunity to increase their knowledge and usefulness. A course for their instruction at a college would give them a chance to distinguish themselves from the self-made "horse doc" who was born with all the scientific knowledge he wants, or will ever have. No live up-to-date graduate fears the competition of a non-graduate; nor should he begrudge him an opportunity to add to his prestige and self-respect.

The non-graduate is usually an oldish man of small means and large family, who can not possibly take a complete veterinary course at college. He will not be with you long. He is dying much more rapidly than the graduate, as noted by M. R. Steffen in the March issue of

the AMERICAN JOURNAL OF VETERINARY MEDICINE, where he stated that out of 250 non-graduates in Wisconsin, 26 have died or retired during the past year, while of 450 graduates in the same state only five have died or retired during the same period. There is no new crop coming on. Laws are nipping them in the bud. Since the non-graduate exists, should not an appropriate course at a suitable college be placed within his reach? FRANK H. PARDEE.

Springvale, Mich.

— —

Such a course is available for licensed practitioners in Pennsylvania and Minnesota, at their respective state universities.

MAD ITCH DUE TO EATING ENSILAGE

On February 15th, I was called to see a five-year-old cow which had been fattened for 90 days on ensilage. The owner found her in the yard rubbing her external genitals on posts, wire fences and sheds. The vulva was enlarged to triple its normal size. The clitoris on examination appeared normal. The vulva was lacerated by barb-wire and nails. When I arrived I found her in a turpentined-dog position, still rubbing her vulva. At regular intervals she would show a spasmodic or jerking condition as if something was irritating her clitoris.

Respirations 100 per minute; temperature 103° F., pulse 80, perspiring freely, partly unconscious, bellowing moaning, standing and recumbent alternately. She died the following day in a paralytic, comatose condition.

Treatment given: Morphine hydrochlorid, 6 grs. without effect. Repeated same dose one-half hour later—no effect. Two hours later one-half ounce of fluid extract of stramonium leaves repeated every two hours without effect.

Diagnostic opinion: Acute nymphomania or some acute affection of the clitoris. This was the third case on the same farm inside of two weeks, but the other two were not fattened. Case No. 2 had aborted about 10 days before she died. In all cases they died within 48 hours after they were affected.

Gladbrook, Iowa. J. F. THOMSEN.

PUTREFACTION IN UTERO

Dr. W. P. Bossenberger, Williams, Ia., wants to know if any one ever saw putrefaction in utero. Will say that I have found a number of cases here in Montana and was beginning to think it a very common occurrence.

Just the other day, March 3rd, I was called to attend a pure bred shorthorn cow. I was informed that the attendant had removed the calf and that it was so rotten that the teeth fell out. I instructed the attendant to flush her uterus out well with warm water and I would drive out in the morning.

On arriving, I found the man all excited, for when he went to wash her out, he found another calf in her, which was so badly decomposed that one could hardly apply any traction at all as both front legs broke off at the knee when attempting to remove the calf. After I had washed her out with five or six buckets of permanganate solution, I dusted about an ounce of boracic acid in the womb, and the last account—she was doing well. J. N. REYNOLDS.

Columbia Falls, Montana.

RELATION OF INTERNAL SECRETION OF THE THYROIDS TO THYROID HYPERPLASIS (GOITRE)

(*Continued from page* 236)

has also been noted that in cases of myxedema and cretinism the improvement is only temporary.

Thyreoglobulin and iodin compounds.—The same results hold good in the case of thyreoglobulin and iodin compounds, as when the extract is used.

Stewart states the relations of iodin to the gland itself, and the modifications in its structure and functions determined by the giving or withholding of iodin, recently studied by Marine, are of great

interest. In all animals, so far as examined, the normal thyroid contains iodin. The amount is variable, but the minimum percentage of iodin necessary, if the normal histological structure is to be maintained, is quite constant for a given species. So also the highest percentage of iodin associated with any degree of active hyperplasia (developing goitre) is always below the normal minimum, as shown by Marine in dogs, sheep, man, and other mammals. As active hyperplasia of the thyroid (goitre) develops, the iodin content of the gland, both relative and absolute, decreases until in the extreme degrees of the condition there may be no demonstrable iodin present at all. Since the iodin is contained in the colloid as an iodine protein compound the generalization may be made that in the thyroid the iodin varies directly with the amount of colloid, and inversely with the degree of hyperplasia. The administration of any iodin containing substance to animals with actively hyperplastic thyroids (goitres) quickly (in two or three weeks in dogs) induces a histological change, the end stage of which is the so-called colloid goitre.

This is a reversion to the normal histological structure, so far as this is possible in a gland which has once undergone hyperplasia.

Transplantation of thyroid tissue.—If a portion of the thyroid be left or a graft be made of some thyroid tissue from an animal of the same species, the effects of myxedema, cretinism and exophthalmic goitre (Grave's diseases) are entirely obviated so long as the graft survives. It has been established that a graft of thyroid tissue from an animal of a different kind, even temporarily succeeds.

Conclusions

Iodin is absolutely essential for the normal activity of the gland. It prevents spontaneous hyperplasia (goitre) and also the compensatory hyperplasia, which follows partial removal of the thyroid. It exercises a curative effect on active hyperplasia. The physiological and therapeutical activity of thyroid substances varies directly with the amount of iodin in it in organic combination (thyreoglobulin).

While the precise function of the organ in the economy remains obscure, it is evident that in most animals and in man its secretion is of great importance.

Present Problems

It has been thoroughly established that thyroid distrubance in puppies and young dogs can be successfully treated by means of thyroid extract or iodin compounds. It is the old standing cases of goitre in dogs and horses, and the outbreaks in young lambs and calves that is attracting our attention. This work is being carried on with the co-operation of the Section of Pathology and the Division of Veterinary Science, and results of this research will be published later.

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DR. W. B. WELCH, D. V. S., President. DR. F. C. STREETER, Mgr.

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A GROUP OF IOWA VETERINARIANS WHO ATTENDED THE STATE MEETING AT AMES LAST FEBRUARY.

Officers of the Iowa Veterinary Medical Association for the Ensuing Year Are as Follows: President, Dr. George W. Blanche of Belle Plain; First Vice-president, Dr. A. Beck of Auburn; Second Vice-president, Dr. S. K. Hazlett of Oelwein; Secretary-treasurer, Dr. H. B. Treman of Rockwell City; Member of the Executive Committee, Dr. J. W. Griffith of Cedar Rapids.

DR. JULIUS CAVAZZI EXONERATED.

In the report of the prosecuting committee for the Veterinary Medical Association of New York City, it was stated on page 131 of the February issue of VETERINARY MEDICINE that Dr. Julius Cavazzi was dismissed from the association and charges preferred against him with the State Board of Examiners due to his conviction of felony. It appears, on investigation that it was shown that Doctor Cavazzi was the victim of misplaced confidence in a fellow countryman, and he was pardoned by the Governor and restored to all of his rights as a citizen. The action of the New York City association in expelling him was thus voided, and the proceedings commenced against him before the State Board of Veterinary Examiners were dropped.

FISTULOUS TRACTS

Fistula and poll-evil is a bugbear to most all practical veterinarians, and there is scarcely a state veterinary meeting held that some member is not called upon to discuss this subject.

Some time ago I read an article in the AMERICAN JOURNAL OF VETERINARY MEDICINE on this subject and I noted the author's feelings toward the operation for fistula and poll-evil. We all know it is an operation we would rather not perform, but circumstances sometimes make it necessary, and the outcome is a very bloody operation, and a dissatisfied client, as they do not like to witness such bloody operations, but it cannot be avoided if you wish to remove the cause by operation.

An advertisement in the AMERICAN JOURNAL OF VETERINARY MEDICINE set me to thinking, and as I have a great many of these cases I decided I would try the treatment advertised. When anything is proven to be a good thing I believe in giving the owner the credit due him. Dr. Wimsetts' Anti-Fis-Tract Tablets are certainly a credit to the doctor for he has practically solved the question of fistulous tracts.

I have used them in several chronic cases and they do just as the doctor says they will; they remove the pyogenic membrane in one piece.

It does away with that undesirable operation, and when properly applied you can expect results.

Pella, Iowa. T. G. FULTZ, D. V.M.

Much has been accomplished during the past two years in Maryland, there having been enacted, during the last session of Legislature, a Veterinary Law that is a great improvement over Maryland's old law and compares most favorably with the veterinary laws of all other states.

Our Association is asking for the names of all Maryland practitioners to be put upon its mailing list. JOHN H. ENGEL

Baltimore, Md. *Sec'y-Treas.*

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Anti-Influenza Vaccine

has proven its merits in the prevention and treatment of Influenza, Strangles and Shipping Fever—for which it is The Ideal Preparation.

Its success with others justifies your confidence.

J. T. KENNEDY
Veterinarian
St. Paul, Minn.

Beebe Biological Laboratories,
City.

Gentlemen:

Regarding the preventive action of your Anti-Influenza Vaccine, I will say that I have used it in several outbreaks, when several hundred horses were concerned, and in my opinion the disease has been prevented in 95 per cent of the cases; the remaining 5 per cent having the disease in very mild form.

The cases were mostly of the mixed infection—strangles, influenza and stable infection.

The abscess formation being entirely eradicated after use of the Vaccine.

Yours very truly,
J. T. KENNEDY, V. S.

SOUTH ST. PAUL HORSE CO.
(Incorporated)
Union Stock Yards
South St. Paul, Minn.

Beebe Biological Laboratories,
St. Paul, Minn.

Gentlemen:

Please send us at your earliest convenience one thousand doses Anti-Influenza Vaccine.

This Vaccine was used by our Veterinarian about three months ago, since when we have given it a thorough trial, having vaccinated about 2,500 horses, and can say that it has fulfilled all our expectations. Think the above order as good an expression of our opinion of it as we can write.

You have our permission to use this letter as you see fit, and we will be glad to recommend your Vaccine to anyone who may refer to us.

Yours respectfully,
SOUTH ST. PAUL HORSE CO.,
Per D. D. Brunson.

A. J. O'HARA
Veterinarian
Member M. S. V. M. A.
Cannon Falls, Minn.

Dr. Beebe,
St. Paul, Minn.

Dear Doctor:

Enclosed please find check for four dollars ($4.00), two for Vaccine received and the other two for another box of six doses mixed Bacterial Vaccine. Please send same at earliest convenience.

The Influenza Vaccine did fine work. Am well pleased with same.

Sincerely yours,
A. J. O'Hara, V. S.

SWIFT & COMPANY
Union Stock Yards
South St. Paul, Minn.

Beebe Biological Laboratories,
St. Paul, Minn.

Gentlemen:

We would like to say in regard to your Anti-Influenza Vaccine that last fall our Veterinarian injected our horses with it. Since the injection not a horse has developed any signs of influenza.

At that time this disease was very prevalent in this locality. In fact, a large horse stable in the yards had many cases of it. **As our horses were around quite a bit, we feel that this was a good test of the reliability of this Vaccine.**

Very truly yours,
SWIFT & COMPANY.

C. A. MACK
Veterinarian
Stillwater, Minn.

Beebe Biological Laboratories,
St. Paul, Minn.

Gentlemen:

In a barn of fifteen horses on a farm two of the horses showed typical symptoms of influenza. We injected the remainder with Anti-Influenza Vaccine and there was no further spread of the disease.

Yours truly,
C. A. MACK, D. V. S.

ST. PAUL UNION STOCK YARDS CO.
South St. Paul, Minn.

Beebe Biological Laboratories,
St. Paul, Minn.

Gentlemen:

We would like to say in regard to your Anti-Influenza Vaccine that last fall our Veterinarian injected our horses with it. Since the injection not a horse has developed any signs of influenza. At that time this disease was very prevalent in this locality. One of our horses was recovering from a severe attack of influenza when others were treated. We feel that this was a good test of the reliability of this Vaccine.

Very truly yours,
ST. PAUL UNION STOCK YARDS CO.,
By Jas. Reid, Superintendent.

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Prices

Single dose	$0.50
Four doses	1.50
Twelve doses	4.00

Beebe Biological Laboratories

St. Paul, Minnesota

Dr. P. E. Boyd of Manheim, Pa., has moved to Columbia and leased a large brick barn at 341 Locust St., in which he will open a hospital and establish an office for practice.

Dr. J. W. Connaway, veterinarian for the Missouri Agricultural Experiment Station, has caused to be introduced into the Missouri legislature a bill preventing the use of hog cholera virus withiin that state, claiming that it has been a cause of the spread of cholera in numberless cases in Missouri. A concerted fight on the bill is being made by the Kansas City Hog Salesmen's Association, all of the anti-hog cholera serum producers in Missouri and others who claim that without the serum-simultaneous treatment, no permanent immunity to hog cholera can be secured.

Dr. G. B. Blackmon, of Nashville, Tenn., a representative of the Tennessee Department of Agriculture, was recently sued for $500 for damages alleged to have been due to the use of hog cholera serum which he sold. The plaintiff was given judgment for the full amount, and immediately two other suits for $2,000 each were instituted. Dr. Blackmon says that he has no financial interest in the matter, that he was merely dispensing serum made in the State plant at Nashville, and that the State of Tennessee is defending the case, and will appeal it to the Circuit Court.

Dr. William M. Strayer, Lancaster, Pa., died recently at his home in his forty-eighth year. He lived in Lancaster since 1886 and enjoyed a large practice in that vicinity.

Dr. L. B. Michael, Collinsville, Ill., recently addressed a monthly meeting of the Madison County Horseshoers' Association on veterinary features of the horseshoer's work. His address was much appreciated by the horshoeres who were privileged to hear it.

There were over 1,700 horses in line in the twelfth annual work horse parade in Boston, ranging in age from a three months' old foal to two champion old horses aged 40 and 41 years, respectively.

Dr. T. J. Foster, of Monticello, Iowa, invited the farmers in his neighborhood to hear an illustrated lecture on hog cholera by Professor I. J. Hawkins, of Indianapolis, and more than one hundred attended. The meeting was voted a great success.

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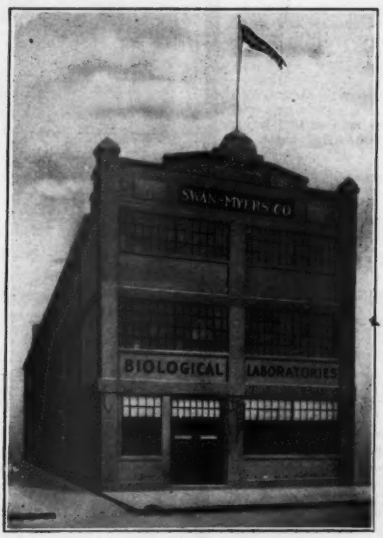

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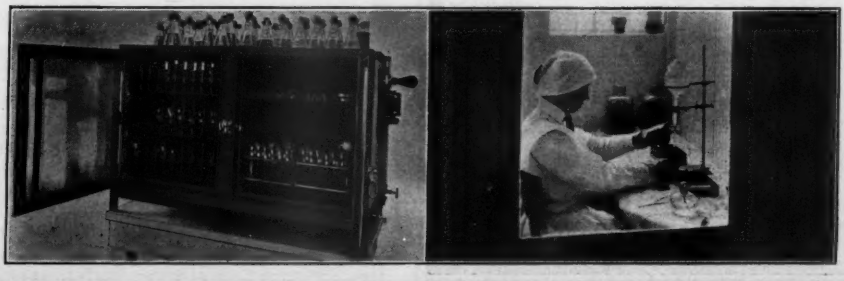

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With the large quantity of "department store", "grip peddler's" and other inferior "junk" instruments on the market, with their imperfections covered with bright nickel and a high polish, and made to sell rather than for practical use, the veterinarian who wants quality is at a loss to know just where to make his purchases with any reasonable assurance of getting goods that will prove satisfactory.

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BOOTH CASTING HARNESS

The harness shown in the accompanying illustration has a double webbing back band and double leather reinforcement throughout. The harness is adjustable, so that it will fit any horse, big or little. It is strong enough for any horse and durable. At the same time, it is not bulky to carry. It has

Booth Casting Harness.

been tried out on heavy horses in the Missouri Valley and on range horses in Colorado and has been found to meet the conditions admirably. It is marketed by the American Veterinary Supply Co., Kansas City, Mo.; the price including cotton ropes is $11.50.

State Veterinarian Charles F. Keane, of California, has ruled that no sheep, cattle or other ruminants will be allowed to enter California for the Panama-Pacific Exposition, or for any other purpose from any area where the foot-and-mouth disease has been found or from localities contiguous thereto.

A bill is pending before the Minnesota legislature with probability favoring its passage, appropriating $30,000 for the university farm for the hog cholera serum plant.

Dr. Brossard, of Ashland, Wisconsin, has just completed arrangements for opening a veterinary hospital, which will be modernly equipped for veterinary practice.

The annual meeting of the Illinois Veterinary Medical and Surgical Association was held at St. Nicolas Hotel in Decatur on January 28th and 29th. The meeting was largely attended and very interesting. Clinics were conducted at the hospital of Dr. S. H. Swain. The following officers were elected

for the ensuing year: President, Dr. B. C. Ballou, Piper City, Ill.; First Vice-President, Dr. W. Smith, Findlay, Ill.; Second Vice-President, Dr. G. D. Crews, Minier, Ill.; Treasurer, Dr. S. H. Swain, Decatur, Ill.; Secretary, Dr. L. G. Rittenhouse, Farmer City, Ill. The next meeting will be held in August, and a notice of the date will be given later.

Dr. H. G. White, Kokomo, Indiana, put in several strenuous weeks combating foot-and-mouth disease in Howard County. His work was satisfactory, but when he presented his bill to the county commissioners, they said the state veterinarians had employed him and the state would have to pay him. The state officials say his work was for the benefit of Howard County and the county will have to pay him. In the meantime, Dr. White refuses to do anything further, exen to issue permits for the movement of cattle until he is paid his back salary, and the state veterinarian refuses to lift the quarantine on Howard County until Dr. White recommends it. The inconvenience of the quarantine is raising a howl from the farmers that will doubtless get Dr. White his pay from somebody soon.

The State Agricultural College of Minnesota held a short course for veterinarians February 22nd to 26th. The program consisted of lectures on Surgery by Dr. John W.

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Adams, of the University of Pennsylvania; Live Stock Sanitation by Dr. M. H. Reynolds; Histology and Physiology by Dr. C. C. Palmer; Hog Cholera by Dr. H. Preston Hoskins; Physiology and Nutrition by Dr. C. C. Palmer; Sterility by Dr. W. L. Boyd; Parasitic Diseases of Livestock by Dr. W. L. Boyd, and addresses by H. R. Smith, T. G. Patterson, T. L. Haecker and Andrew Boss, all of the University of Minnesota. In addition to this, Drs. Chas. E. Cotton and S. H. Ward, of Minneapolis and St. Paul, respectively, addressed the veterinarians during the course.

A change in the veterinary practice law in Nebraska is contemplated in House Bill 272 now before the state legislature. The bill provides that there shall be only one instead of two meetings of the Board of Examiners each year, that veterinarians shall file copy of their licenses with the county clerks in the counties in which they practice, and that any veterinarian who has practiced in the state ten years may continue to practice without a license, providing he files with his county clerk an affidavit on or before September 1, 1915, setting forth that he has practiced in the state ten years. According to the new law, licenses may be revoked for the following causes: employing fraud or deception in examination; failure to file copy of license with county clerk; conviction of crime or misdemeanor involving moral turpitude, habitual intemperance, etc.; issuing certificates of inspection or bills of health without lawful authority; for selling or offering to sell worthless so-called remedies, claiming them to be valuable; for indulging in fraud in their practices in any way.

A bill has been introduced in the Indiana legislature to largely increase the powers of the state veterinarian and to provide for the appointment of a veterinarian at the option of the county commissioners in each county. The bill is designed to enable the state veterinarian to more effectively prevent and suppress the spread of infectious and contagious diseases among domestic animals. The county veterinarians are to be appointed for one year and may be removed on the recommendation of the state veterinarian. Their pay is to be $5.00 a day.

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Arizona.

Senate Bill 58, by Mr. Garvin, provides for the sale by the State Veterinarian at actual cost of hog cholera serum.

Senate Bill 1006, by Mr. Purkitt, referred to the Committee on Agriculture.

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An Act prohibiting the preparation, sale, barter, shipment or exchange of any worthless, contaminated, dangerous, or harmful hog cholera serum or virus; requiring every establishment for the preparation of hog cholera serum or virus to be inspected and licensed by the director of the Agricultural Experiment Station of the University of California; and providing penalties for violation of any of the provisions hereof.

Senate Bill 1008, by Mr. Purkitt, referred to the same Committee, Amends the hog-cholera serum act of 1911. A copy has not yet been received.

Idaho.

House Bill 156, by Committee on Live Stock. Requires all hog cholera serum sold in Idaho to be produced under a license issued by the U. S. Bureau of Animal Industry. Declares that the use of hog cholera serum is not restricted in any way. Provides also as follows:

Section 3. The sale, distribution or use of hog cholera virus is prohibited except under the following conditions, to wit: (a) All virus used for immunizing hogs against cholera shall be administered by graduate veterinarians to whom a permit has been issued by the State Veterinary Surgeon, such permit to be issued only after satisfactory proof of the fact that said veterinarians are qualified to administer hog cholera virus. (b) No virus shall be shipped unless consigned or sold or distributed within the State of Idaho unless consigned to, sold or distributed by a veterinarian holding a permit from the State Veterinary Surgeon. (c) Any veterinarian administering virus and serum shall immediately render a full report to the State Veterinary Surgeon, giving names, addresses of owners and number of hogs treated.

Iowa.

House File 259, by Mr. Brady, referred to the Committee on Agriculture. Amends the present hog cholera serum law to read as follows:

Section 2. That section twenty-five hundred thirty-eight-w3 (2538-w3) be and the same is hereby amended by striking out the entire of said section and inserting in lieu thereof the following:

It shall be the duty of the director of said laboratory to establish and declare the standard degree of potency of hog cholera serum for successfully treating, curbing and controlling hog cholera or swine plague. He shall have the power to make such rules and regulations governing the manufacture of serum in laboratories

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located within the state and doing an intrastate business, as he deems necessary to maintain the potency and purity of their product. He shall have the right himself or through a duly appointed inspector to make such inspection of commercial serum plants doing business under a state permit and of all distributing agencies representing serum manufacturers located outside of the state as will insure a full compliance with the rules and regulations made to govern same. A person, firm, company or corporation before selling or offering for sale within this state any hog cholera serum shall first make application to the director of the laboratory herein created, for permission to sell the same in the state. Said application shall give the name of said person, firm, company or corporation with its place or places of business.

Such other information and samples of serum shall be furnished whenever required by the director. If the director is satisfied that said person, firm, company or corporation is fit, proper and reliable, upon the furnishing of a bond in the sum of one thousand dollars ($1,000.00) by said applicant which bond shall be approved by the director, he shall issue to said person, firm, company or corporation, a permit to sell said serum within the state for a period of one calendar year or part thereof, for which

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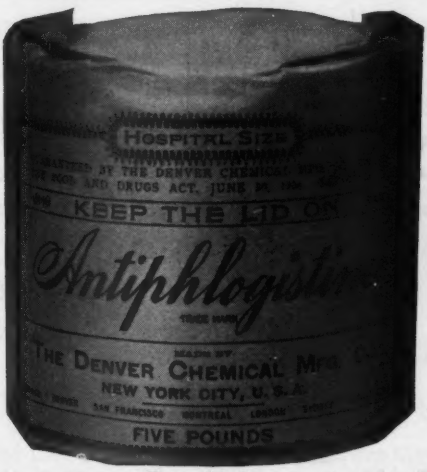

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permit he shall collect the sum of twenty-five dollars ($25.00), which money shall be deposited and handled the same as moneys received for the sale of serum. At the time of the issuing of said permit, the said director shall deliver to said applicant a statement showing the standard or degree of potency of hog cholera serum as established by said director and said permit may at any time be revoked and cancelled by said director when it becomes evident to him that the terms on which it was issued are being violated. No hog cholera serum shall be sold or offered for sale or use, or may be used in this state which is below the standard test of potency established by the director, except for experimental purposes at the place of manufacture of hog cholera serum and under the direction of manager thereof. No permit shall be granted a distributing agency for the distribution of hog cholera and virus manufactured within the state, and no serum laboratory located without the state shall be granted more than one distributing agency permit within the state, for which distributing agency a permit must be secured from the director of the state laboratory, on the same terms and subject to the same provisions as govern the granting of original permits.

Section 3. That section twenty-five hundred thirty-eight-w5 (2538-w5), be and the same is hereby amended by striking out the entire of said section and inserting in lieu thereof the following:

The director of said laboratory is authorized to procure virulent blood or virus from cholera infected hogs and to distribute the same at approximate cost for use with hog cholera serum and under restrictions concerning payments as established in section three (3) of this act. No person, firm, company or corporation shall distribute or sell any portion of virulent blood or virus from cholera infected hogs except to holders of permits to use the same and

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shall report in writing to the director of said laboratory and under such regulations as the said director may issue. And no person shall use any portion of virulent blood or virus from cholera infected hogs unless he has received special instructions in reference to such use of such virulent blood or virus which is satisfactory to the director of said laboratory and said director has issued a permit to such person, and such permit shall be cancelled by said director for cause which said director may deem sufficient; provided that these restrictions shall not apply to official work of, first, veterinary members of the annual health commission or, second, representatives of the United States bureau of animal industry; but all virulent blood or virus used by such persons shall be reported to the director of the serum laboratory in such manner as he may require. Any person, firm, company or corporation violating the terms herein stated shall be punished the same as provided for in section twenty-five hundred thirty-eight-w8 (2538-w8), of this act.

House File 279, by Mr. Cochrane, referred to the Committee on Agriculture, amends section 2538-w5, Supplement to the code, 1913, by striking from said section all that part following the word "used" in the tenth line down to and including the word "require" in the twentieth line, and by substituting in lieu thereof the following:

"And no person shall use any virus from cholera infected hogs except on hogs or herds already infected with hog cholera except when the same shall be used by the director of said laboratory for laboratory purposes."

Kansas.

Senate Bill 617, by Mr. Mahin, referred to the Committee on Live Stock. Prohibits the sale of all serums for the curing or preventing of hog cholera and other animal diseases unless samples are first submitted to the veterinary department of the Agricultural department for inspection and approval. Such serums may only be sold when the standard, grade and quality are so approved. Approved serums must have the approval stamped on the label together with the grade, quality and standard.

Senate Bill 130, by Mr. Troutman, referred to the same committee. Provides as follows:

Section 1. That the following sum or so much thereof as may be necessary for the purposes respectively herein named are hereby appropriated out of the funds in the state treasury not otherwise appropriated to be expended by the State Board of Administration: For furnishing and equipping the anti-hog-cholera serum and virus plant now being op-

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Kansas City Vet. College
Late Veterinarian U. S. Army

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erated at the Kansas Agricultural College at Manhattan, Kansas, the sum of $5,000, and all of said sum is hereby made immediately available. For the propagation, production, transportation and distribution of serum and virus for the cure and prevention of hog cholera in the state of Kansas, the sum of $5,000 for the year ending June 30, 1916, and $5,000 for the year ending June 30, 1917; provided, that the serum and virus herein provided for shall be furnished to the citizens of Kansas at a price not to exceed the cost of propagating, producing, transporting and distributing the same to such citizens as may apply for the same actual and immediate use in curing or preventing hog cholera.

Section 3. That for the purpose of carrying out the provisions of this act the State Board of Administration is hereby empowered to employ and to pay special agents who shall be experts in the propagation, production and use of anti-hog-cholera serum and virus.

Minnesota.

House Bill 345, by Messrs. Bendixon, etc., referred to the Committee on Dairy Products and Live Stock. Senate Bill 264, by Messrs. Potter, etc., referred to the Committee on Finance. A similar Bill.

Section 1. That the sum of Ten Thousand ($ 0.000.00) Dollars, or as much thereof as may be necessary, is hereby appropriated from any moneys in the State Treasury not otherwise appropriated, for the enlargement and equipment of the said hog cholera serum plant of the State of Minnesota at the University Farm, same to be immediately available.

Section 2. That the sum of Twenty Thousand ($20,000.00) Dollars, or as much thereof as may be necessary, is hereby appropriated for the purchasing of hog cholera serum, vaccine or other biological products, Ten Thousand ($10,000.00) Dollars of said sum to be immediately available and Ten Thousand ($10,000.00) Dollars to be available for the fiscal year ending July 31, 1916.

Section 3. That the serum manufactured at the said plant shall be sold and distributed, as near as may be at actual cost to any citizen who is a resident of this State and who ap-

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plied for same as herein prescribed by the said State serum plant, and such selling price shall be stated on the package.

Section 4. That surplus serum produced by said hog cholera plant above a reasonable reserve may be sold out of the State at not less than cost of production.

That in case of need said State serum plant shall be authorized to purchase hog cholera serum, vaccine or other biological products which are deemed reliable and may sell the same at approximate cost in the same manner and under the same regulations as prescribed for serum from the hog cholera serum plant of the State of Minnesota.

Provided, further, that the said state serum plant before selling or distributing any such hog cholera serum, vaccine or other biological products shall exercise all due precautions in purchasing from government licensed plants and shall conduct such inspection or tests of said hog cholera serum, vaccine or biological products as may appear reasonably necessary to insure reliable preparation.

Section 5. The Veterinary Division of the State University shall establish in each county of this State, as necessity may demand, one or more distributing centers where such serum, vaccine or other biological products shall be had for sale, and such serum may be used by any person upon his own hogs, but no person, except licensed veterinarians, shall

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administer said serum upon the hogs of another unless authorized to do so by the State Live Stock Sanitary Board. Said Department of Agriculture shall provide instructions in the proper method of administering said serum to persons who apply therefor and certify to the State Live Stock Sanitary Board for license, said persons when in the judgement of such Department they have qualified themselves therefor.

Montana.

House Bill 243, by Mr. Burnett, appropriated money for the purchase of hog cholera serum by the experiment station of the Montana Agricultural College for the purpose of resale. A copy of this bill has not yet been received.

Nebraska.

Senate Bill 93, by Messrs. Bygland and Ruden, referred to the Committee on Agriculture, and House Bill 158, by Mr. Reisner, referred to the Committee on Live Stock and Grazing.

Section 1. The Board of Regents of the University of Nebraska is hereby authorized and directed to establish at the State Farm at Lincoln, Nebraska, in connection with the Nebraska state college of agriculture and mechanic arts, a laboratory for the manufacture of hog cholera serum, toxines, vaccines and biological products and to provide the necessary equipment therefor. The Regents shall

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appoint the director of said laboratory and such assistants as are deemed necessary to efficiently carry on said work and shall fix the salaries of said assistants.

Section 2. The director of said laboratory shall on application furnish said serum to any person within the state of Nebraska for use in his herd only, together with the specific instructions for the use of same, at the approximate cost of manufacture, and such cost shall be stated on the package. Any surplus serum or other biological products may be sold by said director at a reasonable profit to any applicant outside of the state. The director of the serum laboratory is authorized to purchase serum or other biological products which he deems reliable and he may sell the same at approximate cost in the same manner as products of the laboratory are sold, at any time it appears to him that the available supply will not be sufficient to meet the demand.

Section 4. The director of said laboratory shall have the power and it is made his duty to establish and declare the standard degree of potency of hog cholera serum for successfully treating, curing and controlling hog cholera or swine plague. Any person, firm, company or corporation before selling or offering for sale within this state any hog cholera serum, shall first make application to the director of the laboratory herein created, for permission to sell the same in the state. Said application shall give the name of said person, firm, company or corporation with its place or places of business.

Such other information and samples of serum shall be furnished whenever required by the director. If the director is satisfied that said person, firm, company or corporation is fit, proper and reliable, upon the furnishing of a bond in the sum of one thousand dollars ($1,000.00) by said applicant, which bond shall be approved by the director, he shall issue to said person, firm, company or corporation a permit to sell said serum within the state for a period of one calendar year or

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part thereof, for which permit he shall collect the sum of one dollar ($1.00), which money shall be deposited and handled the same as moneys received for the sale of serum. At the time of issuing said serum, the said director shall deliver to said applicant a statement showing the standard or degree of potency of hog cholera serum as established by said director and said permit may at any time be revoked and cancelled by said director when it becomes evident to him that the terms on which it was issued are being violated. No hog cholera serum shall be sold or offered for sale or kept for sale or use, or be used in this state which is below the standard test of potency established by the director, except for experimental purposes at the place of manufacture of hog cholera serum and under the direction of the manager thereof.

Section 6. The director of said laboratory is authorized to procure virulent blood or virus from cholera infected hogs and to distribute the same at approximate cost for use with hog cholera serum and under restrictions concerning payments as established in section three (3) of this act. No person, firm, company or corporation shall distribute or sell any portion of virulent blood or virus from cholera infected hogs unless permitted in writing so to do by the director of said laboratory and under such regulations as the said director may issue, and such permit shall

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Your money cheerfully refunded if they are not found as advertised.

Write for literature and full description of treatment. Price $1.50 per dozen, two and a half dozen for $3.00.

Winfield, Kansas **I. G. Wimsett, D.V.M.**

specify the time and place, and when and where the said virus may be used. And no person shall use any portion of virulent blood or virus from cholera infected hogs unless he has received special instruction in reference to such use of such virulent blood or virus which is satisfactory to the director of said laboratory and said director has issued a permit to such person, and said permit shall be concelled by said director for cause which said director may deem sufficient; provided, that these restrictions shall not apply to official work of, first, veterinary members of the animal health commission or, second, representatives of the United States bureau of animal industry, but all virulent blood or virus used by such persons shall be reported to the director of the serum laboratory in such a manner as he may require. Any person, firm, company or corporation violating the terms herein stated shall be punished the same as provided for in section eight (8) of this act.

House Bill 699, by Mr. Riescheck. Appropriates $100,000 to build and operate a state hog cholera serum plant.

Senate Bill 197, by Mr. Wesner, House Bill 459, by Mr. Osterman. Declares it unlawful to sell hog cholera serum unless holding an uncancelled, unexpired U. S. Veterinary license, issued by the U. S. Department of Agriculture, and a permit from the Live Stock Sanitary Board.

Section 4. If the Live Stock Sanitary Board shall be satisfied that said person, firm or corporation, referred to in Section 3, is fit, proper and reliable, and upon the furnishing by such corporation, firm or person of a bond in the sum of one thousand dollars ($1,000) to be approved by the Live Stock Sanitary Board, they may issue to said person, firm or coporation a permit to sell serum and virus within the state, for a period of one calendar year, or part thereof, for which permit, the Live Stock Sanitary Board shall collect the sum of five dollars ($5.00), which money shall be deposited in the State Treasury. At the time of issuing such permit, the Live Stock Sanitary Board shall deliver to said applicant a statement showing the standard degree of potency, to be obtained in anti-hog cholera serum, as established by said Live Stock Sanitary Board, and the terms of said permit may at any time be changed, or said permit may be revoked or cancelled, when it becomes evident to the Live Stock Sanitary Board that conditions necessitate a change in the terms of the permit.

Section 8. Records. All persons, firms, or corporations, offering serum or virus for sale in this State, shall furnish a sufficient number of blank reports, sufficient to report the result of vaccination on all hogs so treated. Provided, also, a statement must be made to the Deputy State Veterinarian at the end of each

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Our serum hogs are tuberculin tested. First bleeding serum only. (Do not tail bleed.) All serum is subjected to the rigid test prescribed by the Bureau of Animal Industry on our own pigs. Write for literature. Full information with every order. Serum 1½ cents per c. c. Virus free.

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1,000 applicators, 12-in....45c

$6.50 Perfection Injection and Suction Pump $3.00

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Combination Float.....$1.50

$3.50 Horse Nasal Speculum, each $1.25

$25.00 Auto Cautery...$12.50

$12.00 Mouth Speculum..$7.50

Balling Gun.....$1.50

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month, a report of all shipments of serum or virus, giving name and address of each purchaser and date of shipment. Blanks will be furnished by the Live Stock Sanitary Board, upon application. Any person who shall apply anti-hog cholera serum or virus shall keep an accurate record of the temperature of each animal to which such serum or serum and virus is applied and shall mark, in the most convenient manner all hogs necessary so that at any time within 30 days after vaccination, such person may be able to distinguish all hogs having a temperature higher than 104 degrees at the time of vaccination and be able to distinguish all hogs having a temperature less than 104 degrees at the time of vaccination. A report shall be made at the end of 30 days after vaccination to the Live Stock Sanitary Board, by any person applying said serum or serum and virus, said report to give serial number and the name of manufacturer of serum used and the number of hogs vaccinated, the number of these hogs having temperatures over 104 degrees at the time of vaccination and the number of hogs having temperatures less than 104 degrees at the time of vaccination, and of all hogs dying within 30 days with temperatures over 104 degrees and also of all hogs dying within 30 days with temperatures under 104 degrees, at the time of vaccination. Any person, firm or corporation violating any of the provisions of this section shall be guilty of a misdemeanor and upon conviction thereof, shall be fined in any sum, not less than ten dollars ($10) and not more than five hundred dollars ($500).

Section 9. No person, firm or corporation shall sell or offer for sale any anti-hog-cholera serum or virus within the State of Nebraska without the license seal of the State of Nebraska, or the Department of Agriculture, or both, together with a scale of dosage and the price of said serum or virus per cubic centimeter. No person, firm or corporation, shall give or accept a rebate or commission on any anti-hog-cholera serum or virus that is sold or offered for sale within the State of Nebraska. Any person, firm or corporation, violating any of the provisions of this section shall be guilty of a misdemeanor and upon conviction, thereof, shall be fined in any sum, not less than ten dollars ($10) and not more than five hundred dollars ($500.00).

North Carolina.

House Bill 329, by Mr. Kent, referred to the Committee on Appropriations.

Section 1. The North Carolina Board of Health, under the management of the Director of the State Laboratory of Hygiene shall manufacture and distribute to the people of the State for a sum not exceeding the actual cost, such of the various anti-toxines, vaccines, and sera for the prevention and cure of diseases as in its judgement may be desirable and practicable.

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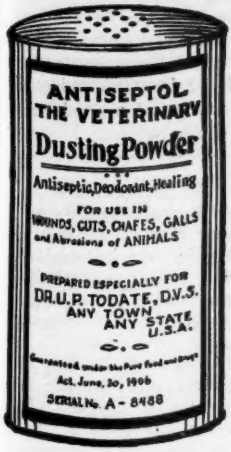
The Veterinary Surgeon's Money-Maker



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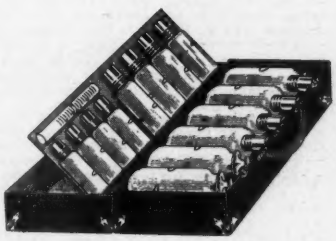

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FOR SALE — PRACTICE AND LONG-TERM lease on up-to-date hospital, operating table, etc., in city of 85,000. A snap if taken at once. Address H. R. Hornbaker, D. V. M., 205 First St., Peoria, Ill.

WANTED—ALL COPIES OF THE FEBRUARY issue of the American Journal of Veterinary Medicine which you do not care to preserve. We are short of this issue and badly in need of extra copies. Send us what you have. American Journal of Veterinary Medicine, Evanston, Ill.

FORCED TO SELL ONE-FIFTH INTEREST (20 shares) in hog cholera serum business, incorporated; government license; modern; established trade; big returns; $3,000.00. Address No. 66, care of Veterinary Medicine.

POSITION WANTED AS ASSISTANT TO VETerinarian (country practice preferred) by second year student, who wants experience during summer. References as to character, etc., on request. Apply to Geo. W. Rawson, U. S. College of Veterinary Surgeons, Washington, D. C.

POSITION WANTED BY A GRADUATE VETERinarian with an anti-hog cholera serum company. Address No. 65, care of Veterinary Medicine.

WANTED—SEVERAL DOGS AND CATS SUBject to asthma. We will pay cash and express charges from any point in the United States. Dr. N. F. Pease, Austin Veterinary Hospital, Austin, Texas.

FOR SALE—A $2,000.00 PRACTICE IN GOOD irrigated district. Price, $950.00. Includes 36x60 adobe barn, four box stalls and room for five more. Address Box 6, Maxwell, New Mexico.

FOR SALE—WELL ESTABLISHED PRACTICE in county seat of one of the richest counties in Michigan with practically no opposition. Residence, hospital and extra barn, all within two blocks of court house. This must be sold within six weeks at great sacrifice. Other business. Address No. 67, care of Veterinary Medicine.

VETERINARY PRACTICES FURNISHED AND sold in 48 states. Physicians, dentists and nurses furnished and located. Drugstores for sale and drug positions in all states. F. V. Kniest, R. P., Omaha, Nebr. Established 1904.

WANTED—GRADUATE VETERINARIANS FOR good locations in Texas. Established practices sold. Write The American Veterinary Exchange, Box 1395, Houston, Texas.

FOR SALE—WISCONSIN COUNTRY PRACtice of $2500.00 to $3000.00 per year. Instruments, drugs, etc., $350.00. Address No. 68, care of Veterinary Medicine.

FOR SALE—ONE OF THE BEST GROWING practices in Northwestern Ohio and one that the right man can build to one of the best paying in this section of the State; also half interest in two live stock specialties that will in a short time make the owner the cost price of his practice. Can show you the best proposition you ever saw. Everything must go with it. Would stay and work with purchaser for two months. Do not write unless you have the money to buy this business. Address No. 69, care of Veterinary Medicine.

SOUTH DAKOTA PRACTICE FOR SALE. THIS practice now will run about $3,000 a year and grow to $4,000 a year. Prosperous country. Large territory. Have equipment, automobile, etc. Address P. E. Foster, D. V. M., Astoria, S. D.

FOR SALE—LIVERY BARN AND PRACTICE for cash or part cash or half interest. Barn makes $3,000; practice $3,250. Too much for me; reason, poor health. Address 1051 N. St. Francis Ave., Wichita, Kans.

There is an opening for a veterinarian at New Canton, Illinois. Mr. C. L. Hopkins, secretary of the Farmers' Co-Operative League in that city, would like to correspond with some one seeking a location, and states that a young man just out of a good veterinary college is preferred.

Likes Them All.

Regarding "Swine Diseases," by Dr. A. T. Kinsley, I wish to state that to use it is not only a pleasure, but it is very instructive to read a treatise on this subject written by a man of Dr. Kinsley's caliber. It is a good and well boiled-down account of diseases affecting swine. Equally as valuable I find "Colics and Their Treatment," "Poultry Diseases," "Animal Parasites and Parasitic Diseases," "Lynch's Diseases of Swine," "Special Veterinary Therapy," Frohner's "Textbook of General Therapeutics," "Springtime Surgery," "Veterinary State Board Questions and Answers," and last, but not least, the AMERICAN JOURNAL OF VETERINARY MEDICINE. These publications should have a place in every veterinarian's library.

Linsborg, Kans. PHINEAS PETERSON.

Dr. White's "Animal Castration" is fine, and makes the subject practical, as it appears in the real field, when we get up against the real work. Of course Dr. Kinsley's book is always right and deep, and I like it for that. Dr. Kaupp's book is the best I ever read or saw on that subject, and I like it very much.

W. G. GREGORY, D. V. S.

Fort Worth, Texas.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF AUGUST 24, 1912,

Of AMERICAN JOURNAL OF VETERINARY MEDICINE, published monthly at Chicago, for April 1st, 1915.

Editor, D. M. Campbell, Evanston, Ill.
Managing Editor, none.
Business Managers, none.
Publisher, D. M. Campbell, Evanston, Ill.
Owner, D. M. Campbell, Evanston, Ill.
Known bondholders, mortgagees, and other security holders, none.

D. M. CAMPBELL.

Dr. Edw. P. Westell, a widely known veterinarian of Winnipeg, Manitoba, recently died at the age of fifty-eight years, leaving a widow, one daughter and one granddaughter. Dr. Westell was for many years a resident of Port Huron, Ontario, and quarantine inspector for the Dominion Government.

Attorney General Walter C. Owen, of Wisconsin, has rendered an opinion to State Veterinarian O. E. Eliason, in which he holds that a veterinarian cannot legally require a druggist to put up a prescription for spirituous liquors as a regular physician can. The inability to prescribe booze will not prove a hindrance to Wisconsin veterinarians.

A new outbreak of foot-and-mouth disease at Carlyle, Indiana, has been reported recently. The epizootic first appeared in the state at Carlyle last October and was supposed to have been eradicated for several months. The source of the infection has not been discovered.

Dr. R. H. Schrecengost, of Swea City, Iowa, has purchased a lot on which to erect a modernly equipped veterinary hospital with living rooms above. Dr. Schrecengost has been in Swea City less than a year, and in that time has acquired a profitable practice, a wife, and now a hospital—a good record.

The Professional (?) Card of an Unusual Quack

William A. Cleveland, V.S.

Manufacturer and Proprietor of

Cleveland's Bone Blister and Absorbent

The Most Perfect Remedy Ever Used on a Horse.

No Sore, No Blemish, No Disease of Horse.

Will Positively Remove Ringbones, Spavins, Curbs and Splints, and heals open sores of any nature.

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We pay $1.00 a piece for them. The ones our Corn Absolvent will not permanently cure without the use of knife, making them sore or causing one particle of pain. Have you got them? Do they ache? Do they ache and pain you? Come and get a bottle of the Absorbent and try it. It gives instant relief to the most sore and painful ones and permanently cures them in from 3 to 15 days. You lose them while you sleep. Price 50c per bottle with instructions, or we treat them for you at our office, Hotel Nicklet, Central Avenue, 224½, Room 3, Hot Springs, Ark.

DR. WM. A. CLEVELAND

Attendants at Bath Houses can make arrangements to have this medicine on commission. Call and see the Doctor. Office Hours: 9 to 12 m., 1 to 4 p. m., 7 to 9 p. m.

Dr. W. C. Stub, St. Georges, Grenada, British West Indies, sailed on the transport ship Marnia from Baltimore, February 22nd, to join the British Army Veterinary Corps.

DR. G. I. BLANCHARD, Pres. **DR. E. B. HOLLECKER, Lab. Supervisor**

ANTI-HOG CHOLERA SERUM

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Buy government licensed serum and protect your hogs. We get it at it's best

We take the blood from the hyper-immune when it contains the most anti-bodies and, therefore, is highest in potency. We do not bleed from the tail at different intervals, getting serums of various degrees of strength, but we kill the hog when his hyper-immunity has reached the highest point and take all the blood at one time. That is why our serum gives such universal satisfaction.

Our serum is a positive immunizing agent and stands high as a curative.

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Just from the press.

This book is written by an American author and is based on American methods. It should be invaluable to every practitioner and student of veterinary science. It not only describes but illustrates each step of the operation of castrating and spaying, including their complications and sequelae as applied to the stallion, colt, mule, bull, boar, ram, dog, cat, fowl, mare, cow, sow, ewe and bitch. The chapters on Cryptorchid and Monorchid castration alone are well worth the price of the book. 260 pages with 209 illustrations mostly from original photographs.

RESTRAINT OF DOMESTIC ANIMALS

By the same author.

Over 300 pages, with 332 illustrations, made from drawings by one of the best pen artists in the United States. It illustrates and fully describes every known means of restraint of the horse, ox, dog and hog. This is by far the best illustrated book ever written in America on any branch of veterinary science.

These books are published by the author. For sale by all veterinary book sellers. Sent post or express prepaid to any address upon receipt of price.

Price: Animal Castration, $4.00; Restraint of Domestic Animals, $3.75.

NEWS ITEMS

Forty-eight thousand dollars was spent for hogs from whose blood cholera serum was made by the Ames Vaccine Co., Ft. Dodge, Iowa, last year. The annual meeting of stockholders was held recently, and the following directors were elected: Dr. E. E. Sears of Algona, Dr. Frank Ludgate, F. J. Schwingel and Dr. D. E. Baughman of Fort Dodge.

Dr. Smith of Farmer City was elected president of the Central Illinois Veterinarians' Association, an organization recently formed at a meeting held at Gibson City, Ill.

Nebraska legislators voted down a resolution providing that a veterinarian must have ten years' practice before qualifying as a practitioner.

A delegation of farmers inspected a herd of tuberculous cattle at the Reiland packing plant in Grand Rapids, Wis., recently. The tuberculin test was made by Dr. A. J. Abbott of Marshfield. The reliability of the test was fully proved.

Dr. J. S. Anderson of Seward is the new State Veterinarian in Nebraska, having taken the post recently resigned by Dr. L. C. Kigin.

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Unless it is produced in a sanitary plant with sanitary equipment.

Then, why not buy LABORATORY EQUIPMENT that is SANITARY and approved by the Department.

Do we sell it? Well, I should say we do, lots of it. Write us for particulars. Following are a few standard lines. Order them today.

Timmers Steam Sterilizer. Price, each	$140.00
Aluminum Container 160,000 cc. Price, each	60.00
Post-mortem Tables. Price, per square foot	1.50
All Steel Sanitary Hoist. Price, each	7.50
Aluminum Handle Sticking Knife. Price, each	.75
Gauze Holders for serum cans. Price, per dozen	1.00
Moulded Hose, ¾-inch. Price, per foot	.12
Aluminum Clot Press. Price, each	10.00
Patented Hypering Table. Price, each	60.00
Killing Restrainers. Price, each	6.00

JOE TIMMER

THE TINNER. And That "Aint" Near All.

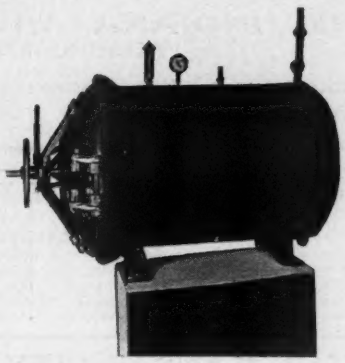
"HARD-WEAR" MOST. Kansas City, Kas., Western Hemisphere.

Congressman C. N. McArthur of Portland, Oregon, has filed a claim against Polk County for $375,000, the amount of damages he alleges due him because of the condemnation of 15 head of fine dairy cattle. The stock was ordered killed by State Veterinarian Dr. W. H. Lytle.

A five-year-old steer weighing 2,230 pounds that has never tasted grain has been discovered by State Veterinarian Davis at Sun, Wyoming. The animal would be worth about $200 for beef.

Dr. F. J. Foley, City Veterinarian at Kinston, N. C., has started a campaign against the sale of tuberculous meat. In a canvass which he made recently, a large quantity of the infected meat was found and condemned.

The Michigan Agricultural College veterinary clinic for the free treatment of horses, cows, dogs, cats and dumb brutes in general, is working in fine order. Vast benefit is being derived by stock owners in the vicinity of the hospital. The surgery building completed a short time ago at East Lansing cost in the neighborhood of $35,000.



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Vol. I. Respiratory and Circulatory. New chapters on Blood and Lymph. pp. 557, $4., 3d Ed., 1910.
Vol. II. Digestive, Hepatic, Tryptic, New Chapters on Poisons, Ductless Glands, Hormones, Metabolism and Autointoxication. pp. 592, $4. 3d Ed. 1911.
Vol. III. Nervous, Genito-urinary, Eye, Skin, Systemic. pp. 611, $4. 3d Ed. 1911.
Vol. IV. Microbian, Pestiferous, Prevention, Suppression, Exclusion, Micropathology, Serum Poisons, Serum Therapy, Immunization, etc. Scientific principles, general and specific. pp. 789, $5. 3d Ed. 1912.
Vol. V. Parasites and Parasitism. Scientific Extinction. pp. 564, $4. 2d Ed. 1909.
Vol. IV. Has General Index of Vols. I to IV. 3d Ed.

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